Amaryllidaceae

William Herbert

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H413

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THE GIFT OF

Asa Gray.

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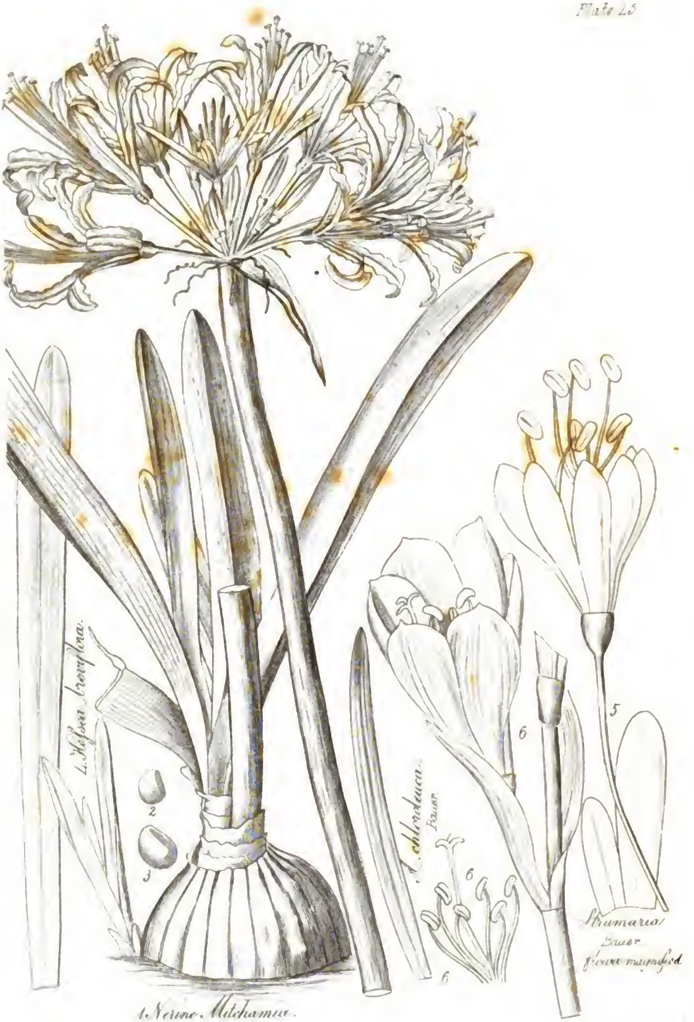
Plate 25



A. Herbert del.

AMARYLLIDACEÆ;

A. Gray

PRECEDED BY

AN ATTEMPT TO ARRANGE

THE

MONOCOTYLEDONOUS ORDERS,

AND FOLLOWED BY A

TREATISE ON CROSS-BRED VEGETABLES,

AND

SUPPLEMENT.

BY THE

HON. AND REV. WILLIAM HERBERT.

◆

"Flores hujus generis eximii sunt; nescio num secundam parem habeat; hinc Bellædonnæ dictæ plures. Bella donna Virgilii, Amaryllis dicta, nomine transiit in proverbium de omni grato."—*Linn. de Amaryllide, Hort. Cliff. p.* 135.

WITH FORTY-EIGHT PLATES.

LONDON:
JAMES RIDGWAY AND SONS, PICCADILLY.
MDCCCXXXVII.

April [illegible] 1837
see advertisement [illegible]

TO HIS MAJESTY

LEOPOLD,

KING OF THE BELGIANS.

Sir,

My recollection of many interesting conversations with your Majesty on botanical and horticultural topics assures me, that the subject of this work, however inadequately treated, will not fail to be interesting to your Majesty, notwithstanding the important occupations of your present exalted station. I am induced by a sense of the unvarying kindness shewn to me by your Majesty, while resident in this country, to inscribe this volume, with your gracious permission, to your Majesty, and to subscribe myself respectfully, with every wish for the prosperity of your Majesty and your kingdom,

Your Majesty's
Most grateful
And obedient humble Servant,

WILLIAM HERBERT.

Spofforth,
December 26, 1836.

ADVERTISEMENT.

The receipt of a fresh supply of valuable specimens, for which I am indebted to Sir W. Hooker, after the printing of the body of this work had been completed, has enabled me to add amongst the supplemental observations the description of several fine plants before unknown. The supplemental articles have been arranged in alphabetical order, as the most convenient for reference, and it will be apparent what place each additional plant should occupy in the consecutive arrangement. The reader is particularly requested to refer from Alstrœmeria, Bomarea, Crinum, Habranthus, Hæmanthus, Hermione, Hippeastrum, Oporanthus, and Sternebergia to the Supplement. From each of the magnificent umbels of additional species of Bomarea, I could only afford space to represent a single flower and leaf, which will be sufficient to facilitate their identification. The publisher having been desirous of offering some copies to the public with coloured plates, it must be understood that, where no live specimen has been seen in this country, and no precise memorandum of the colours has been given by the collector, the plates could only be made to represent the existing tints of the dry specimens, which are in many cases very fallacious. Those who have been accustomed to examine dry specimens, will however be able to form a better judgment by seeing what the existing colours are.

It is my intention, as opportunities may occur, to prepare memoranda for rectifying and supplying the deficiencies of this work, and any communications relating to it, if left for me free of expense at the publishers, will be attended to thankfully. Any dry specimens, seeds, or roots, of newly introduced Amaryllidaceous plants, especially from the

Western hemisphere, will be gratefully received. Crinum Forbesianum, Amar. grandiflora, Brunsv. striata, minor, radula, Nerine marginata, Strumaria, Hessea, Imhofia, Carpolyza, and Panc. Canariense amongst the African, Sternebergia, Erinosma (Leucojum) Carpathicum, Lapiedra, Vagaria, Tapeinanthus, Hermione elegans, serotina, Queltia juncifolia, pumila, pusilla, Ganymedes cernuus (triandrus), capax, and reflexus, seed of Q. fœtida, odora, montana, Maclaeana, are more particularly wanting to me amongst the species of the Old World.

The reference to the figures of Pancratium Cambayense and longiflorum, pl. 42, is omitted by accident, p. 207-8, but is marked in the index. The Glossary, for the use of unlearned readers, will be found at p. 417.

I have not thought it adviseable to load this work with voluminous quotations and references to old works, which the reader would probably not be desirous of consulting. It will be understood that, where I have not expressed the contrary, I mean to assent to the synonyms and references given by the modern writers who have treated of the several plants described, especially Reaumer and Schultes, and the editors of the Bot. Mag. and Reg.

It has been suggested to me to extend my labours to Iridaceæ, and perhaps to Liliaceæ, and ultimately embrace the whole hexapetaloid portion of agynandrous exspadiceous plants. I doubt whether I shall have sufficient leisure, and it remains to be seen whether the reception of this work will encourage the publisher, who has liberally promoted it, to any further undertaking; and indeed, whether I can obtain access to the plants it would be necessary to investigate; but, if those who may possess them will assist me in that respect, I am not indisposed to make preparations for the accomplishment of such a work.

WILLIAM HERBERT.

Spofforth, Dec. 1836.

ERRATA.

P. 25, l. 7, *for* and hexandrous, *read* and hypogynous.
— 27, l. 28, *for* trian-, *read* pentan-.
— 39, l. 2, *for* Amaryllidaceous, *read* Amaryllidean.
— 52. l. 16, *for* Juncagineæ *read* Juncaginaceæ.
— 52, l. 31, Orchidaceæ *should be in Italics.*
— 54, l. 2, *for* subsequalia, *read* subæqualia.
— 59, *place* ‡ one-flowered, *after* seeds testaceous.
— 61, *for* § 4 *read* § 5.
— 67, *for* operculosæ *read* operculatæ.
— 71, char. of Habranthus, *for* fasciculata *read* semifasciculata.
— *for* § 4. *read* § 5.
— Recumbens, *for* fig. 1. *read* fig. 2.
— 119, l. 37, *for* 3—3. *read* 2—3.
— 122, l. 18, *for* 23 *read* 33.
— 163, last line, *for* ochroleuca *read* chloroleuca.
P. 182, l. 8, *for* Caribbea *read* Caribea.
— 207, l. 26, *after* Hove. *insert* Pl. 42. f. 1.
— 208, l. 21, *after* Banks. *insert* Pl. 42. f. 2.
— 212, *for* Caribæa *read* Caribea.
— 215 and 239, *for* Distychum *read* Distichum.
— 267, last line, *for* Mr. *read* Dr.
— 281, l. 13, *for* Radulosa *read* Burchelliana.
— 299, l. 29, *for* but before *read* bud before.
— 300, l. 15, *for* cup *read* tube.
— 300, l. 30, *for* about 1⅜ long *read* about 1⅛ long.
— 306, l. 1, in character of Ganymedes, *for* apicem versùs vix *read* non.
— 308, l. 31, *for* ⅛ *read* 1⅛.
— 310, last line, *for* 133 *read* 123.
— 318, *for* Verbanensis *read* Verbanus.
— 335, l. 2, *for* appears *read* appear.
— 382, l. 25, *for* Agaveæ *read* Agaviformes.
— 399, last line, *for* 5 *read* 4.

Shortly will be published,

ATTILA,

BY

THE HON. AND REV. W. HERBERT.

CONTAINING

1. Attila, or the Triumph of Christianity: a poem.
2. Attila and his Predecessors: an historical treatise.

EXPLANATION OF TERMS.

As these pages are intended for the use and assistance of the unlearned cultivator, as well as for the edification of the scientific, I wish to premise a few words concerning some terms which will be used in them. It has been justly considered that, in plants which, like the Amaryllideæ, have no calyx, the outer divisions or segments of the flower stand in lieu of calyx, and the inner of corolla, and such a flower is called a perianth, the outer or calycine segments sepals, the inner or corolline segments petals. The number of filaments being equal to those segments at or below the base of which they are usually inserted, I propose to call those which belong to the outer segments the sepaline filaments, and those which belong to the inner the petaline filaments. I find a great laxity in the language of botanists in defining flowers which have a tubular appearance, though perhaps no tube at all, which they call indiscriminately tubular, *tubulosi*, so that it cannot be ascertained from their definitions whether the perianth is really tubular or divided to the base. I propose to rectify this by the following appropriation of distinct terms; tubatus, tubed or having a tube, whether long or short; tubulosus, long-tubed; tubiformis, tube-shaped, or having the semblance of a tube; tubæformis, trumpet-shaped: and I hope that such a necessary distinction may be observed in all future definitions. I find also that it is not possible from the definitions of any botanist to ascertain with certainty whether a perianth is really divided or not, as they are in the habit of calling flowers trifid or six-cleft, tripartite or sexpartite, of which the segments are connected at the base; I shall call the perianth sexpartite where the segments are unconnected, deeply cleft where there is an annular union, and I consider a mere annular union of the base to be scarcely a tube. In plants which are only known to me by the description of others, I cannot ascertain the fact, in consequence of the laxity of their expressions. Latin adjectives in *osus* always signify an excess of the quality; such words have been greatly misapplied by botanists, and I erred in naming a plant in the Botanical Register Pharium fistulosum, which must be called P. fistulatum, for fistulosum really means either full of pores like a sponge, or having one enormous pore. I shall use such words strictly, ex. gr. Spadicosus having a large spadix ; spadiceus or spadicatus having a spadix. Dr. Lindley has unfortunately made an extensive use of the termination *osus*, which it is very necessary to rectify. The termination *inus* may be conveniently substituted to answer his purpose ; but the subversion of latinity by the misuse of a termination which has a decided meaning is very objectionable. We are forced to create mongrel Latin to express what the Romans never thought of expressing, but we should write correct Latin where we can ; on which account I protest against the use, too frequent amongst botanists, of *illis* and *eis* for *those* with a genitive following, as semina illis Amaryllidis conformis instead of semina Amaryllidi conformis or conformia. By a linear leaf I understand, that the lines of its margin are parallel. Much confusion has been made by using the word linearis to signify also indiscriminately a line long, or a line wide, which should be expressed by lineam latum ; nor does it seem to be uniformly established, what portion of an inch is meant by a line, being the tenth part of an inch according to Dr. Johnson, and the twelfth according to French mensuration. The unlearned reader is further referred to a glossary at the end of the volume.

PRELIMINARY TREATISE.

Having been requested to prepare for the press a second edition of a treatise, which I published in 1821, on the plants included previously under the genera Amaryllis, Crinum, Pancratium, and Cyrtanthus, I have felt that it would be desirable to render it as complete as the further information I now possess concerning them will enable me, though it is in some respects still defective, and it was represented to me that it would be preferable to extend the scheme of my work to the whole natural order of Amaryllideæ; but, conformably with the latest practice, I have adopted the superior term Amaryllidaceæ, and confined the former name to a subordinate portion. I have to regret however that, not having contemplated a further publication, I have neglected during the last fifteen years opportunities of noting down points, which I cannot now readily ascertain. In pursuance of my present undertaking, it was a principal object to arrange according to their affinities the different kinds of plants of which the order consists, a task by no means easy, because the concatenation of vegetables does not proceed in a straight line, and perhaps the truest arrangement would be in a circle, with lateral lines from some points in the circumference either falling into it at some other point, or branching off to meet some other order. For this reason, although a consecutive arrangement is necessary for convenience, it cannot be expected that the concatenation should be perfect. In proceeding with such a work, the first point to be considered is what plants are comprised under the natural order Amaryllidaceæ, and what are its essential characteristics. A great difficulty occurs here at the outset; for although the system of classing plants by what modern botanists have called natural orders is entirely the fashion of the present day, every writer who has treated of this order refers to Dr. Brown's Prodromus for the definition, and on reference to the work of that most distinguished botanist, on whose accuracy in all points that he has thoroughly investigated we may peculiarly rely, we find a definition founded upon facts incorrectly assumed, in consequence of an incomplete knowledge of the plants which it is reputed to comprehend. It is therefore the first necessary part of my labour to frame a new definition of the natural order, so as in truth to comprise the plants it contains; and my definition will be found to include some extensive genera which have not been usually placed under it. Of such I shall think it sufficient to point out the characters, without entering into a full account of the species which are numerous, especially in Hypoxis, and not well known to me, but of which the details may be found, as far as they are ascertained, in the valuable and comprehensive work of Reaumer and Schultes. Before I can proceed to the execution of the task imposed upon me, it becomes necessary to consider what is that system of natural orders which has nearly superseded the Linnæan, or, as modern writers term it, the artificial system. It appears to me that a more gross misuse of words has rarely invaded any department of science, for if ever an arrangement was artificial, it is that now adopted of vegetable orders, the characters of which depend upon a variety of features taken *ad libitum*, and in many cases erroneous in consequence of insufficient information, and which when defined have been thrown together in a variable mass of confusion according to the successive notions of different writers concerning their affinities to each other, and which cannot possibly be placed in any natural succession, because they are like octagon, hexagon, pentagon, and other angular figures, coming in contact with each other at their various sides, so that some natural affinity must be torn apart when they are put in succession. If we refer to Brown's valuable Prodromus and to Sweet's Hortus Britannicus, we find the orders placed in different succession; and even if the point of precedence could be definitively settled, which is not likely to be the case, it depends on opinion and not on fact; nor can the arrangement be used for reference without an index; for no person, unless very deeply versed in the science, can be expected to remember the relative position of between two and three hundred orders, or to come easily at the facts on which the arrangement is built. I must pray the forgiveness of those who are much more deeply versed than I am in botanical studies, when I venture to say that something better digested is requisite for a general system of botany. The Linnæan, with its imperfections, is an arrangement at least as natural (for indeed all arrangements must be artificial) and it is founded upon facts of easier access, the succession of classes being for the most part necessary, and laying no great tax on the memory.

So vague are the given characters of the orders however amended, and upon so weak a foundation does botany stand at present, that although perhaps the only point that truly divides Asphodeleæ from Amaryllideæ of Brown is the flower of the latter growing above the germen and of the former under it, that feature is passed over as undetermined in Dr. Brown's definition of Asphodeleæ, and he rests mainly the character of that order on the seed-shell being black crustaceous and brittle, and those of Hemerocallideæ and Amaryllideæ on the seeds being neither black nor brittle, which distinctions appear to vanish upon further examination; for I have at this moment before me seed of Albuca amongst the Asphodeleæ with the shell softer and less fragile than any of the black-seeded Amaryllideæ or at least equally so, and that of Hemerocallis, from which the second of these orders is named, with the shell black as jet, and perhaps as fragile as that of any seed that exists. In the next place on the assumption of the facts above stated, we find Dr. Brown subsequently constructing a new order of Hypoxideæ (*App. to Flinders*), separated from Asphodeleæ by the flower above the germen, and from Amaryllideæ by the hardness of the seed-shell and the vague direction of the radicle. A black-shelled seed, almost equally hard, will be found in Pancratium Illyricum, and others of that order, and there seems to be rather a graduated difference of hardness than a diversity of structure. I have not made any microscopic observations on the interior of the minute seed of Hypoxis, and any feature of such difficult investigation seems to me unfit to characterise a natural order of plants, though very proper to be subjoined as a subsidiary observation. I apprehend that Dr. Brown must mean that the original posture of the radicle in the embryo is a little irregular, a point which does not appear to me of high importance, for I apprehend that in a hard-shelled seed it must ultimately issue at the natural passage which is the foramen. The ultimate direction of the radicle is vague in Crinum and Hymenocallis, and it pierces the fleshy mass with an irregular direction, and does not often issue at the natural passage. Its direction is also in those seeds often vague from the first, Dr. Brown has mentioned elsewhere the strange circumstance, that when those seeds are ripe and detached from the capsule, the embryo is often not discoverable, yet will become apparent after it has lain awhile on the ground, and that an artificial direction may be occasionally given to it; and in such cases the original direction of the embryo is vague. For instance an Hymenocallis in my stove had ripened a considerable number of seeds above an inch long; I cut open several and found a cavity within the fleshy mass, but no appearance of an embryo, and the seeds might have been supposed to be incapable of vegetating; the remainder were laid upon a pot of earth, and after the lapse of several weeks every one of them sprouted vigorously, the radicle issuing on the side in contact with the earth. In such case it must have been drawn towards the earth by some influence, and, if not bent at its earliest manifestation, the point of the embryo must have been kept straight at first by the toughness of the inner coat of the cavity, and have turned the moment it had issued from it; but its being kept straight by the toughness of the inner coat of the cavity in which it lies, till it can find a vent, cannot be a distinguishing feature of very high importance. I should have supposed that the embryo, though not discoverable by the magnifier I applied to it, must have existed originally in a very minute state, but Dr. Brown asserts in the Linnæan Transactions, xii. 149, that its formation is subsequent to the separation of the seed in such cases; a recondite point, which I have not had a sufficiently powerful magnifier to investigate. I beg not in any manner to be considered as imputing blame to a gentleman whose botanical skill and information exceeds mine immeasurably, and who has minutely enquired into many difficult points connected with the science, on account of any lapses, which are the necessary consequence of an imperfect knowledge of the profusion of various yet kindred vegetables, with which the Almighty has adorned our world; but when fundamental errors meet me in the outset at each step, without travelling beyond the immediate object of my labours, I must be allowed at least to say that the science is yet in its infancy, and that its most distinguished professors are still feeling their way in the dark, or at least have not been yet able to emerge into broad day-light.

My friend, Professor Lindley, whose writings are daily adding to his deserved reputation, conscious of the unsatisfactory and chaotic state of the present system of botany, has attempted in a very ingenious and useful tract to arrange the orders by some intelligible and regular course of divisions. Valuable as his labours are in this and in all other respects, I may say without any offence to him, that such are the radical and insuperable defects of the system, that the attempt only serves to make darkness visible, and shew the points wherein it is utterly artificial and repugnant to nature. I cannot, however, proceed with any observations that have the least bearing on the botanical labours of that gentleman, without previously expressing not only the high opinion I entertain of his talents and acquirements, but the obligations under which I feel myself to him, not only for the liberality with which he has entrusted to me portions of his library and valuable herbarium, but for the invariable urbanity and kindness with which he has favoured me with his opinion and instruction on some points, concerning which I found my general information deficient, and indeed upon every occasion in which I was desirous of his advice. I may take this opportunity of returning equal thanks to Sir. W. Hooker for the liberality with which he has sent to me from Glasgow the whole of his valuable specimens of Amaryllidaceous plants, enabling me to describe and make outlines of a great number hitherto unknown, and for the alacrity with which he has replied to any questions I had occasion to put to him. Mr. Bentham has kindly communicated his specimens of Narcisseæ. To Dr. Brown and Mr. Bennett of the British Museum and to Professor Don I am indebted for the civility with which they assisted me to inspect the Banksian herbarium and those of Mr. Lambert and the Linnæan Society; and from Dr. Graham, the distinguished professor of the Edinburgh University, and Dr. Neill, of Canon-mills Cottage, near Edinburgh, I have received some interesting communications. To Mr. Sabine and to the garden of the Horticultural Society I am indebted for a copious supply of fresh specimens of Narcissi; to the Rev. William Ellicombe for some others; and I owe thanks to the liberality of Mr. Murray of the Glasgow botanic garden, and Mr. Loddiges of Hackney, for the opportunity of examining some plants which I should not otherwise have seen; and to Mr. Anderson of the Chelsea Garden for seeds of Narcissi, and for some information concerning the several varieties.

Dr. Lindley perceived, with his usual clearness of intellect, that (assuming the natural orders to be correct, or at least capable of being so reformed as to become unexceptionable) they must be distributed and classed under a succession of more satisfactory superior divisions before they could be made available for a scientific arrangement. Through his ample information concerning the structure and diversity of vegetables, I yet hope that he will be able ultimately to put together a stable and true system of botany; and it will be enough for me, who have not sufficient knowledge of facts to enter into all the details, if I can point out the fundamental errors of the existing system, and the mode by which according to my view a better must be constructed. There seem to me two radical errors in Professor Lindley's alliances. I do not, however, impute them to him, but to the system, which it was perhaps not easy for him to deal with more accurately in its present state. The first is, that he attempts to place the greater part of vegetables in subdivisions equally distant from the point of universal agreement, which is artificial in the extreme, and in direct opposition to nature. At the first step he gives us five classes, which in truth are formed of a primary, secondary, and tertiary division united. He next subdivides the dicotyledonous plants into four grades, viz. sub-classes, groups, alliances, and orders; the monocotyledonous, being fewer, into three, viz. groups, alliances, and orders; the sexless and root-flowering into orders only. But the Almighty did not thus restrict himself in the affinities of his creation; he did not make the immense variety of vegetables with a limitation that they should branch out into five or six or any defined number of points of difference from one original archetypal structure. There is a point in which all vegetables must agree; that which separates them from the other parts of the creation. Some may detach themselves perhaps from the whole mass of vegetables by a single peculiar feature; some may separate themselves at an early period, and others after a long series of previous subdivisions. There is no law that equalizes their affinities to each other; and any system that shall pretend to subdivide them by a limited number of grades, must be fundamentally false. My second objection is that the divisions are inconsistent and contradictory, which is, perhaps, a necessary consequence of the first wrong step. For instance, Dr. Lindley's second group of many-petaled bicotyledonous plants is Epigynosæ, that is to say, having the ovary under the stamens; but this group of epigynous plants is not opposed by him to those which are not epigynous, but only includes such of the epigynous plants as he finds it convenient to place in it, while he puts two whole alliances of epigynous orders in the first subclass, though the being epigynous is the distinguishing characteristic of the second. I repeat that I am not finding fault with him, but with the chaos from which he was struggling to emerge, if it had been practicable. Let me be clearly understood. After having separated (as I shall propose to do) corolliform flowers, from those which are glumaceous or scaly, like grasses, it may perhaps be found advisable in one of those classes to place the division epigynous and its converse hypogynous before, and in the other after, the divisions hexandrous and triandrous, if such a disposition shall appear to group the vegetables better according to their general aspect and affinity; but having once assumed the epigynous position of the stamens as the limiting feature of a class, we cannot place epigynous plants in the other classes which have been cut off by the absence of that feature; for if the class epigynous is limited to those epigynous plants only which have not such and such other features, those other subordinate features are thereby exalted into a primary station and the separations are confounded; the points assumed for distinction may possibly be correct, but they are not properly exhibited. This cannot be illustrated better than by examining Dr. Lindley's third subclass, viz. the monopetalous plants, which he thus divides into five groups; the first consists specially, of those whose ovary is composed of many carpels; the third of but one perfect carpel; the fifth of two carpels; the second of plants with epigynous stamens, i.e. inserted above the ovary; the fourth of those whose flower has a lip. Here are three features, the number of carpels or folded leaves in the structure of the ovary, the position of the stamens, and the lip of the flower, set in opposition, though not opposite, but consistent with each other. Consequently we find the whole fourth class composed of ovaries with two carpels, though that is the characteristic of the fifth; the second partly of those with two, and partly of those with many carpels, which should belong separately to the first and fifth; the first and third contain epigynous plants, which belong properly to the second; and the fifth is described as consisting of unsymmetrical flowers, yet there are others unsymmetrical in the third. The view of the whole is therefore confused, and no true division is made. But this may be reduced to a lucid order. Supposing the number of carpels to be of high importance, concerning which I do not wish to give any opinion, the first division* would be Aggyrosæ or rather Monocarposæ, i.e. of one carpel; 2. Dicarposæ, of two carpels; 3. Polycarposæ, of three or more carpels. Each of those divisions may then be divided into symmetrical and unsymmetrical as to the flower; and those divisions again into epigynous and its opposite hypogynous. There is a like confusion at the outset, where vegetables are divided improperly into five primary classes. 1. Outgrowing, with reference to the mode of increasing their bulk by outward deposits. 2. Naked-seeded, which are also outgrowing. 3. Ingrowing, or increasing their bulk inwardly. 4. Root-flowering, which are not stated whether to be outgrowing or ingrowing. 5. Top-growing. Of these the two first are dicotyledonous, having two seed-lobes, the third monocotyledonous, having one, and the fifth acotyledonous, having none. The four first of these are sexual, and the last sexless or rather sex not apparent. The first real division is Sexual and Sex not apparent. The next division of sexual is Acotyledonous, which takes his whole fourth class, Monocotyledonous, which takes the third, and Dicotyledonous, which covers the first and second; and dicotyledonous may be then, if it be thought fit, divided into Naked-seeded and Close-seeded. If Dr. Lindley will apply his extensive knowledge and correct judgment to elucidate the system in this manner, he will place it on a satisfactory and permanent footing, being careful however not to let any feature rank above those which should precede it. I believe him (as well as that distinguished continental botanist Monsieur Decandolle) to have a mind much above the narrow wish of adhering to any thing because he has published it, or rejecting any thing because it is suggested by one like myself, of very inferior botanical knowledge; and I would earnestly excite him to perfect that system upon which he has thrown a strong, but as yet insufficient, light. I apprehend no ultimate difference of opinion between me and him, or any other person of clear understanding and unprejudiced mind, because I build only on fact, and by that test I wish every thing I advance to be tried, and should instantly correct any thing I found inconsistent with it. It is a main object of this Treatise to reduce the divisions which rest on opinion, to their proper insignificancy.

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* In the second edition of Dr. Lindley's Natural System of Botany these divisions are altered to, 1. Polycarpous. 2. Epigynous. 3. Monocarpous. 4. Nucamentaceous. 5. Dicarpous. The real arrangement should be (supposing the points assumed to be the most valuable that could be found). 1. One-carpelled. 2. Two-carpelled; *a*. capsular. *b*. nucamentaceous. 3. Many-carpelled; *a*. hypogynous. *b*. epigynous.

The principal merit of the Linnæan division was, that each separation rested on a single fact of pretty easy access, although it might remove to too great a distance genera, associated by other peculiarities. The system now in vogue, will be found to rest in many respects on features quite as artificial, which separate kindred genera as objectionally as its predecessor. I am at a loss to conceive, in what manner it can possibly be substantiated, that the position of the stamens adopted by Jussieu is a more *natural* feature for classification than their number, by which Linnæus was guided in most of his classes. They are evidently facts of like nature and deserve about equal weight; but the position of the stamens, instead of ranking high amongst natural subdivisions as assumed by Jussieu, ought to occupy a very subordinate place. To illustrate this I may state, that there are plants amongst Amaryllideæ, which but for the difference of having the perianth and stamens superior instead of inferior to the ovary, would be almost identical with others amongst Asphodeleæ; for instance, if the scentless Alliums of the latter, (an occidental race forming, I believe, a separate genus, which might be called Pseudoscordum), had the ovary inferior, it would require nice discrimination to separate them from Lapiedra of the former, and their general aspect would touch very close upon Strumaria, though there would be points of distinction; yet plants which are separated from actual identity of genus by little more than that feature and some difference of seed, which escape the observation of an uninstructed observer, are not merely removed by Dr. Lindley's arrangement into a different alliance, but two whole groups, ten alliances, and twenty-five natural orders intervene between them. Such incongruities are found in every mode by which the orders have been arranged. In Sweet's Hortus Britannicus we find the water-lilies close to the berberries: and such is the natural system which is to supersede the artificial system of Linnæus. It is founded in part upon facts of no greater importance, in part on an assumed coincidence of a variety of points, concerning which the knowledge of man is still very imperfect, and which from time to time, as our information becomes more ample, evince themselves to have been incorrectly assumed. In consequence of the discovery of such lapses, fresh subdivisions are made, and new orders successively carved out of the wrecks of the original divisions, to be themselves overturned in like manner by fresh curtailments: and in the mean time the orders, between two and three hundred in number, are a mass of unfathomable confusion.

There is but one mode of proceeding, with a view to place the divisions on a sound and durable footing, that is, to found every separation on a single fact, and to work downwards from the first division, with cautious examination of the relative importance and consequent priority of the facts, by which the subordinate divisions are to be limited. This has not yet been done; but, whether I live to see it acomplished or not, I am confident that sooner or later it must be effected, because it is the only mode of classification consistent with nature. It has been a subject of very general complaint amongst those who, without having applied their minds to botanical study, are interested in the cultivation of plants, and consequently in the general outlines of botany, and especially in its nomenclature, that it appears to be based upon a very vague and changeable foundation; and the frequent alteration of the names, with which they were familiar, becomes a source of considerable annoyance. It must however be recollected, that if the alteration of name is consequent on the detection of an error in the preexisting arrangement, the retention of that which had been used before would be an irrational adherence to that which is false; and that our unwillingness to accede to alterations which arise necessarily from a corrected view of the subject, indicates an indolence of mind that would obstruct the progress of human knowledge. On the other hand it is no less evident, that if alterations are made capriciously and not based upon a correct and tangible foundation, discredit is thrown on the science by the instability of the views of its professors, and the students become disgusted on the very threshold of the building, which they are invited to enter and contemplate.

So difficult is it for man to penetrate the mysteries of nature, that no science can be cultivated successfully, of which the professors are tenacious of the sentiments they have adopted, and not willing at all times frankly to reconsider the opinions they have advanced, as different facts, or different views of facts already ascertained, are presented to their notice. But it is scarcely less important to establish some fundamental principles by which the mode of forming and arranging the inductions to be drawn from the facts which are ascertained, may be divested of capricious uncertainty; or the information that is obtained will become a mass of confusion, the more palpable, from the futility of the attempts to disentangle it.

The first great division of the vegetable creation is between those in which sexual propagation is manifest, and those in which, as in funguses, the mode of increase is a concealed mystery: they have therefore been called phanerogamous and cryptogamous, that is, the first having manifest, the second concealed, wedlock ; which seems to me preferable to the later terms sexual and sexless, because the latter word assumes a fact which cannot be substantiated. The next division of phanerogamous plants is into monocotyledonous and dicotyledonous, the latter having two seedling leaves, the former one, or rather that which stands in lieu of cotyledons; and perhaps acotyledones without any, consisting of the root-flowering plants like Rafflesia, which are little understood. In the former the growth is said to be made by successive additions to the outside, in the second, to the centre of the plant, whence they are also called Exogenous and Endogenous; the former, at least in their perfect formation, being recognised by a distinct deposit of bark, wood, and pith. These are the great separations of the vegetable creation, and it will not appear that any kindred races are found indiscriminately in either division, though there is a point of approximation between the monocotyledonous and dicotyledonous plants. These lines are therefore clear and substantial; but we cannot proceed a step further without danger of error, by placing a less important before an essential distinction. The Amaryllidaceæ, which I have undertaken to arrange, belong to the monocotyledonous plants, which, being less numerous, can of course be more easily classed. Although I have not sufficient knowledge of all the orders they contain, to flatter myself that I can make a perfect disposition of them, yet, as it is necessary for me to reform the errors which I find in the existing character of Amaryllideæ, I will try so to trace the peculiarities which separate them from other vegetables, as to chalk out the scheme by which that whole subdivision should be arranged. It is incumbent on me, however, first to enumerate some at least of the inaccuracies which I observe in Dr. Brown's character of Amaryllideæ and the cognate orders, for the purpose of shewing that they cannot stand as at present constituted; their consideration being forced upon me by the subject of my undertaking. It must however be premised, that as Dr. Brown did not enumerate all the genera of which the several orders are now reputed to consist, he is by no means answerable for the disagreement of some of those genera with the characters he has defined, though further enquiry may have shewn that they cannot be excluded without inconsistency. To commence with Amaryllideæ: 1. Perianth in six divisions (sex-divisum) is incorrect, for it excludes the tube which is very common in the order; and if not meant to exclude the tube or annular junction of the segments, it seems incorrectly worded, and at all events nugatory, since all the cognate orders are equally six-cleft at the apex. 2. Regular is inaccurate, if I rightly understand the expression, that it is intended to indicate that the sepals and petals are respectively uniform, witness the genus Alstrœmeria. 3. Stamina inserted at the base of the segments is inapplicable, for they are frequently inserted in the tube, agreeing thereby with his character of Hemerocallideæ, and sometimes on the disk of the germen. 4. Anthers anterior, cannot be assumed as the distinction of one order, unless the same distinction is carried through the kindred orders, yet in Melanthaceæ we find anthers both anterior and posterior. It is however an important feature and seems there improperly confounded. 5. Style one is not correct; the style is triple or tricomposite, often tripartible. I have even seen it tripartite; but it is equally triple in all the cognate orders. 6. Stigma 3-lobed is not correct; the stigma in many genera is not 3-lobed, as it is stated to be, and the angles are even obsolete, nor is it distinguishable from that of Hemerocallideæ, which he terms 3-lobed or simple. 7. Pericarp 3-valved or a berry, is not an accurate fact. In Crinum it is not valved, yet it is not what Dr. Brown himself calls bacca or berry, but something intermediate between that and a capsule. 8. I demur to its ever being a berry, if Dr. Lindley's definition of a berry is correct, that it is "a succulent fruit, the seeds of which lose their adhesion when ripe and lie loose in a pulp;" and as a berry is usually such, and cannot be two different things, I am satisfied that this definition is true. That which Dr. Brown calls a berry in Tamus, has never been properly described. It has a thin (and usually bright coloured) outer skin; a soft juicy pulp between it and the inner coat, which is a three-valved dehiscent capsule, bearing the dissepiments on the valves, the seeds lying in three distinct cells. This remarkable fruit shews the futility of separating the berry-like pericarp of some plants in the cognate orders, from the valved capsule. 9. Seeds with a shell neither black nor crustaceous is entirely without foundation, and applies to only a small portion of the order. 10. Embryo straight, with the radicle pointing to the umbilicus seems to me incorrect. The radicle properly points to the foramen; but I have seen the embryo in Crinum at an early period very curved, and its ultimate direction is quite vague. Neither in Crinum nor in Hymenocallis does it usually issue near the umbilicus. There is not in truth a single point that I can ascertain to separate Amaryllidaceæ from Hemerocallideæ, but the germen inferior to the perianth and stamens in the former, and superior in the latter. There is no true separation made between Asphodeleæ and Hemerocallideæ. Dr. Brown's distinction of the latter by seeds neither black nor crustaceous, and the former by seeds with a shell black fragile and crustaceous, is certainly inaccurate, the seed of Hemerocallis itself being black and fragile, and that of Albuca amongst Asphodeleæ soft and foliaceous. There is not in the given character of Dioscoreæ a single true point to separate it from Amaryllideæ except being diœcious, which is not even a sure generic distinction, as may be exemplified by Vitis. Tameæ are separated by nothing but a supposed berry (which in fact is not a berry) instead of a capsule, a variation which occurs elsewhere both in Amaryllideæ and Asphodeleæ, and is therefore no distinctive mark of an order. If any separation of Tamus and Dioscoreæ can be founded on the veins, it is unnoticed by Dr. Brown. Smilaceæ are admitted to differ, from the portion of Asphodeleæ which have berry-like fruit, in little but the integuments of the seeds, and in the style being often trifid: if the style is not always trifid, its being so sometimes is no distinction, and the closely allied genera

Bulbocodium and Colchicum, distinguished by a tripartite and a tripartible style, shew that the actual separation of the three styles, which are usually either conjoined or consolidated, does not furnish a substantial feature to distinguish a natural order; and in Dr. Brown's own character of Melanthaceæ we find *style trifid or tripartite.* Posterior anthers would have afforded a safe character for that order or rather suborder, but Dr. Brown has included plants with anterior anthers, which makes the given character nugatory, there being no other feature really decisive. With respect to difference in the integuments of the seeds, the striking anomaly in that feature between the most closely united genera of Amaryllideæ (as for instance Pancratium and Hymenocallis, Lencojum and Galanthus) shews that it is of no certain weight in distinguishing natural orders of plants. The beaked umbilicus, by which Dr. Brown characterises Hypoxideæ, is very dissimilar in Hypoxis and Curculigo, and I understand that it is entirely wanting in that portion of Curculigo which must be detached under the name Molineria.

I cannot too strongly disclaim any intention to depreciate the valuable labours of a gentleman whose life has been devoted to the cultivation of a science, which to me has been only the amusement of some leisure hours, and with whose botanical knowledge my own is comparatively light as air. He is one of the most conspicuous ornaments of the study he has pursued; but in the arrangement of these orders he appears to have supposed the features, which he observed in some genera, to be more prevalent than they prove to be; and I have no doubt that he is fully aware that there are imperfections in the characters framed many years ago, which more intimate acquaintance with the subject matter makes it necessary to remove, and I am far from flattering myself that I can perfectly accomplish their reformation.

We should constantly bear in mind that there can be but one real division, that is identity of kind, or, in other words, generic distinction; the secret bar by which the Almighty has made His works incapable of being blended with each other, and confounded in their propagation. All divisions, except that of generic identity are artificial, and rest on the supposed agreement of different individuals in one or more essential points of structure; and when any such point is assumed for classification, the question must arise whether it does or does not separate individuals which agree in another point of greater, or in more than one of equal, apparent importance. The individuality of kinds in the sexual creation rests on the possibility of their being propagated by union, and is limited by a secret impediment, probably depending on the unsearchable adaptation of the minutest vessels through which that union is to be effected; but the object of the limitation being to prevent the union of things dissimilar, there will be outward appearances to indicate the existing bar, and the skill of the botanist must be exerted to distinguish which are the features that are really symptomatic of the impediment, and which, from not being so, are unessential. Botany is therefore a science of conjecture in its fundamental office, the distinction of genera. We assume from observation and analogy, that certain points indicate an absolute diversity of kind; horticultural experiments bring the accuracy of those assumptions to the test, and either confirm or refute them, by proving the possibility of sexual intermixture to be, or not to be, limited in accordance with those points. The Almighty has allowed the several genera of vegetables to disport themselves in numerous forms of species and local or accidental varieties, which are more or less capable of intermixture according to their constitution and diversity, with various degrees of fecundity and sterility in the united produce. It seems to me utter waste of words to argue whether vegetables, if of one genus or identical kind, are species or varieties; if they are found different in a natural state and maintain their diversity when removed to different localities, they are usually termed species; if they return to the more general type when removed, or if the difference is trifling, they are properly termed local varieties, in contradistinction from cultivated and accidental variations. But this distinction is of very subordinate importance; it is a matter of convenience and opinion, and not of fact. The discrimination of genera, or identical kinds, by whatever term that identity shall be signified, is the true basis of botanical labours.

We are unable to ascertain when or how their subdivision took place into the numerous forms which now adorn the earth, and have been termed species and varieties. The various races of mankind were certainly distinguished at a very early period after the deluge, probably at the very time of the miraculous dispersion, and separation of tongues;

and I apprehend that the distinction of vegetable species is mainly referable to a period as early, and was consequent on the dispersion of seeds into different climates by the operation of the deluge. Looking to the multitude of forms which the several kinds or genera have assumed, it becomes a matter of considerable difficulty, and requires much discernment, to ascertain which are the features that may be relied upon as indicating an absolute and original diversity. The specific differences in one kind may embrace a wide range; the actual difference between another kind and those most nearly resembling it may be very small. The feature which is symptomatic of individuality in one family of kindred plants, may not be so in another; such as the absence or presence of a tube or any particular appendage. In forming generic characters we are but seeking signs whereby to come at the knowledge of a fact, namely, the individuality of a thing described. For the purpose of assisting our view of nature, we arrange them in groups, to which however no distinct limits were assigned by the Creator; and, though we are trying to find out the ways of nature, our classifications, by whatever name we may call them, are artificial, and if we proceed beyond one step at a time, we must be liable to find ourselves baffled by the reality. When I began, many years ago, to write concerning vegetables, I had to combat an idea that the Almighty had created each species of our botanical catalogues as it now exists, and that plants being able to breed together was the test of their identity as species. It has since been ascertained beyond dispute, as I then anticipated, that in some genera all the species are capable of easy intermixture; and that even some, which botanists had erroneously placed in different genera,* could produce a fertile cross-breed. It cannot be asserted on the other hand that such are merely instances of erroneous multiplication of species by botanists, because they include almost every sort of diversity which, when found among spontaneous vegetables, have generally been taken as specific characteristics, and the facility of intermixture seems to depend less on the botanical than the constitutional affinity of kindred species; so that either the whole existing machinery of species must be upheld, or they must fall together. The opinion, which I had at first to combat, is therefore falling to the ground by the irrefragable test of facts, which are daily becoming more notorious; and we cannot proceed a step without floundering into inconsistencies, unless we take the generic characters to be the definitions of identity of kind, and in strict agreement with that, they must, where it shall appear necessary, be carefully reformed. Jussieu has stated, in the perspicuous Latin Introduction to his History of Plants, that the foundation of botanical science rests on the distinction of species, which he defines to be a perennial succession of like individuals renewed by continual generations, and adds that although they may be sometimes a little diversified by climate, disease, or culture, the seminal produce will return to the original type. He then considers the union of species in genera to be a discretionary work for the assistance of the memory, attempted at first without rule, and latterly constructed with more propriety by reference to the fructification. Upon the same premises I should have come to the same conclusion; but that statement is contradicted by the complete confusion of vegetable species which may be produced by reciprocal intermixture; and horticultural experiments have established, beyond the possibility of refutation, that botanical species are only a higher and more permanent class of varieties; and that even the local and cultivated varieties to which he alludes, if they do not come in contact with other varieties, instead of reverting, as he supposed, to an original type, are renewed with considerable uniformity in their generations. It is now certain that individuality does not, as Jussieu had imagined, coincide with the species of botanists, but with a higher and more comprehensive grade, which seems to accord with such genera as are truly defined, and would agree with all if properly reformed; and if he had known, what our later experiments have established, his logical mind would certainly have assented to my proposition, which is in truth but the application of his own doctrine to facts which have since come to light. The labours of the many distinguished cultivators of the science have been daily tending to place the genera on a correct footing, but it will never be perfectly accomplished till the erroneous notion of the original diversity of all vegetable species is thoroughly discarded. If the original constructors of the system had known all that is at present ascertained, they would perhaps have called the botanical genera species, and the species varieties; but it does not appear to me advisable at present to make such an alteration, on account of the extreme inconvenience of such an extensive change. We are not certain that there is an exact analogy as to the diversification of individuals in their generation, between animals and vegetables, the latter having branched more extensively into different grades of variety, some of which can re-unite with facility, while others seem so constitutionally altered, as to be almost incapable of now mixing with the other grades; so that the arrangement and nomenclature is not objectionable, if we only bear in mind that the botanic genera define the individuality of kind. If any botanist should tell me, that in framing a generic character he was not seeking signs whereby to come at the knowledge of a fact, namely, the individuality of the thing described, I should answer, that if such is not his object, whatever name he may assign to the character, he has nothing in his science real or tangible; that it is the vague offspring of variable opinion; that he is amusing himself with child's play, and might as well build castles with the sand. If, instead of proceeding by single steps from the first point of general agreement to the last important point of generic identity, we throw together a number of kinds, and include them under the character of an order framed to cover their diversities, we are arranging them in groups to which no such limits were assigned by the Creator; and our classifications, by whatever name we may call them, are artificial; and we must be liable to find our labours, on further investigation, defeated by the reality. If we divide all vegetables, according to their agreement, by single points of difference, till we reach that which separates them from their nearest kindred, every plant, when rightly known, will have its proper place, and the whole system will be built on truth, and not the offspring of opinion.

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* For instance, Crinum and Amaryllis.

To make a perfect arrangement of the monocotyledonous plants, to which division the plants of which I am about to treat belong, it would be requisite that I should have a thorough knowledge of all the orders it contains; and even in framing the character of Amaryllidaceæ, I must be liable to lapses, from the want of perfect acquaintance with those from which they are to be separated; and I must apologize for any such errors, if they should occur, which will be easily rectified by those who are more intimately acquainted with the other portions of the previous divisions. If any botanist should, therefore, perceive that my limitation does not effectually exclude some race, to which his attention has been more closely directed, let him not blame me for the want of more accurate knowledge, which I do not pretend to have acquired, but let him substitute the term which his own more perfect investigation shall have ascertained to be more effectual for their exclusion.

The monocotyledonous plants were divided by Jussieu into three classes:—1. Having the stamens inserted above the germen or future seed-vessel. 2. Inserted round it. 3. Inserted below it. This is a distinction of easy access; but to judge what rank it should hold of itself, we must see whether all the plants in each of those classes are more akin to each other, than to any which are not included in it; and it is evident that Asphodeleæ, Hemerocallideæ, and Melanthaceæ, are more nearly allied to Amaryllideæ in another class, than to Palms and Rushes in their own. It is therefore bad on the face of it as a natural division, that is, a limitation of natural groups; it is as much an artificial division as the number of stamens, nor is it more convenient than the Linnæan arrangements, though it might be combined with them. Another mode of classification suggested itself from the structure of seeds, and Dr. Brown founded the characters of several orders mainly on the colour, hardness, and separability of their external integument, and the direction of the embryo. These characters were assumed on a partial view of the seeds of some of the plants they were intended to include, or at least of those which they are now held to comprehend, and the result is, that they are inconsistent with the fact. Hardness and inseparability, softness and separability, of the seed-coat occur in plants so closely allied, that although I consider it a proof of generic difference, their generic distinction has not yet been universally admitted by botanists; as, for instance, Pancratium and Hymenocallis. I have already noticed the seeming vagueness of the radicle in some plants where Dr. Brown has assumed its direction to be certain, and if correct, it is too secret and concealed a feature for general application. The hardness and softness of the integument is so uncertain, that it is found soft in plants in which, according to Dr. Brown's character, it should be crustaceous and fragile. It is therefore evident, that the hardness and separability of the seed-coat, and the direction of the embryo, furnish no satisfactory characters for the definition of natural groups amongst monocotyledonous plants. It is certainly possible that the integuments of the seed, which are variable in one family, may assume a more certain character in others. I do not presume to give an opinion concerning those which I have not examined, but we should admit with caution in one race that which has utterly deceived us in another. The form of the leaves might be expected to furnish some distinguishing feature, but it is so variable, even in particular genera, that little reliance can be placed upon it, and it must be admitted with great circumspection. For instance, Professor Lindley characterized Hypoxideæ as having plicate leaves, whereas, if the fact were absolutely true with respect to the particular plants he meant to designate, we find plain and plicate leaves so intermixed in the nearly related order of Irideæ, and even in the several genera thereof, that it cannot be taken here as a natural distinguishing character, without the most striking inconsistency. I wish it were true, that in the leaves of exogenous or bicotyledonous plants, the veins are concurrent and form a kind of network, and in endogenous or monocotyledonous are parallel and cross-barred; and that scitamineous plants are distinguishable amongst the latter by being feather-veined, that is, having oblique veins proceeding from the midrib. I have before me the leaf of a Nepal Arum, closely allied to Arum Dracontium, in which the veins are as concurrent as in the leaf of a lime tree; and of Caladium, in which they are confluent, though with less of network; of a Dioscorea, in which the venation is very like that of a poplar; of Costus among the Scitamineæ, of which the leaf is not more feather-veined than of Crinum spectabile, and other petiolated wide-leaved Amaryllideæ; and on the other hand, of a lofty Dracæna or Cordyline, which I raised by seed from Norfolk Island (perhaps *C. stricta) amongst Asphodeleæ, which is completely feather-veined. Dr. Brown describes parallel veins even as distinguishing an Australian species of Dioscorea from others of that genus, and some such variability appears according to the representations of different species of Peperoma. These peculiarities require more careful inspection than they have yet received.

Another feature presents itself in the nature of the capsule or fruit, some opening by valves, some indehiscent; and in the integuments of the seed, some hard, some fragile, others pulpy and soft. To shew that such peculiarities are

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* The Botanical Magazine gives parallel veins to that plant, I believe incorrectly.

good for nothing as characters of natural groups, though valid in generic separations, it is sufficient to name Hæmanthus with a pulpy berry-like fruit, and Buphane with a valved capsule, yet so closely allied that they have been heretofore considered one genus, and are not distinguished by any other striking feature. The shape of the seed-pod cannot be relied upon with certainty, even as a generic distinction; and Linnæus, when he divided tetradynamia into siliculosa and siliquosa made a very unsatisfactory separation. The simple fact, whether the seed is naked or covered, furnishes, perhaps, a limitation of more value, if any have it really naked, but it does not help us to subdivide monocotyledonous plants, because they all have it covered, except where it is exposed by the early disruption of the pericarp. It is something to have cleared the way of features which, though they have been used, are evidently not available as the distinctions of natural groups; and although these considerations, when duly appreciated, must shew the necessity of superseding a great part of the present arrangement, they will help to lead us to something more substantial. I will suggest, as well as the limited information I possess will enable me, the features that appear to me to separate the monocotyledonous plants into natural groups, calling to mind that natural groups are properly such as will strike the unscientific eye as having some general resemblance, without searching for a minute point of agreement. I have to regret, that in order to ascertain any one point concerning any class of vegetables, it is necessary to examine afresh almost every plant of which it consists, from the silence or lax expressions of botanists, and the absolute falsehood of many of our engravings in material points; and, with respect to the venation of leaves in particular plants, our books are generally silent, and the engravings frequently give an untrue representation, so that I cannot obtain the information I desire.

The palms, aroid, and piperaceous plants, form a conspicuous division amongst the monocotyledonous plants, and the spadix seems to me the great point of agreement. Spadix originally meant the inflorescence of the palm, that is to say, flowers without the semblance of a corolla, closely set round a stalk which has an involucre below. There is a defective spadix, which wants the involucre, in piperaceous plants and bullrushes; and there may, perhaps, be a difference between a fibrous or woody, and a succulent, spadix. The division opposed to Spadiceous, consists of those with petaloid flowers which are not closely set round a stalk with an involucre at the base; they have not the spadix, and may therefore be called Exspadiceous. In all divisions of vegetables, individuals will be found that depart a little from the limits assigned, because the Creator has not strictly drawn those limits of classification, but has softened down, as it were, the edge of difference by an easy transition. The groups, however, are not the less real on that account, though some individuals will exceed the boundaries; so we find Orontium, Tupistra, Aspidistra, and Tacca, forming a sort of limbo between the spadiceous and scapaceous plants, and, on the other hand, Pontederia and some others, together with the Scitamineous plants, advancing from the corolliform towards the habit of the spadiceous plants. They may therefore be well placed in an intermediate division as Subspadiceous, that is, having a tendency to the form of a true spadix.

The spadiceous plants, I believe, may be divided into, 1. Involucrate or true, including Palms and Aroid plants. 2. Nudæ, Naked, including Piperaceæ and Typhaceæ. The involucrate into Ligneous, covering the palms, and Succulent, designating the Arums, &c., but I am not certain of the truth of the distinction of fibrous and succulent here, and do not pretend to make a perfect subordinate arrangement. If succulency does not universally distinguish the Aroidæ, the petaloid involucre will furnish one feature of separation, the mode of fructification another, and probably the veins of the leaves another. The subspadiceous will divide, I believe, into 1. Subcorolliform, and 2. Corolliform. The first covers Orontium and those which have no involucre amongst Orontiaceæ, the Acoroid and fluvial plants; the second will be divisible into monoperianthine and biperianthine, the former covering the aquatic, the latter the scitamineous plants.

The corolliform are divisible into gynandrous, of which the stamens are consolidated with the style, covering the Orchidaceous plants and their kindred, and agynandrous, in which they are not so consolidated. The agynandrous may be subdivided into tripetaloid having the semblance of three petals and hexapetaloid of six. The tripetaloid into monogynous having one style, which are Bromeliaceæ and Commelinaceæ, and pleiogynous having more styles, which are Butomaceæ and Alismaceæ. The hexapetaloid into triandrous with three stamens, and hexandrous with six. The triandrous into epigynous having the germen or ovary underneath, (viz. Iridaceæ, Burmanniaceæ and Hæmodoraceæ limited,) and hypogynous having the germen above, that is a portion of the present order Hæmodoraceæ, which I propose to call Wachendorfaceæ. The hexandrous divide in the same manner into epigynous and hexandrous. That hexandrous epigynous division is the immutable line by which I limit the character of the order Amaryllidaceæ, and the corresponding hypogynous hexandrous division forms the boundary of Liliaceæ. Both are capable of further subdivisions into suborders and sections, and whether those subdivisions shall be exalted or not into the station of orders, is a question of discretion, and not of fact. If it should appear that any invariable feature, which distinguishes the subdivisions, affords a line of demarcation more conspicuous than those which I have taken of hexandrous or epigynous, it should be inserted in the fittest situation to characterize and unite the plants it may include. For instance, if on further acquaintance with the several species, we should ascertain that any certain venation leaves or mode of inflorescence distinguishes Dioscoreæ, Smilaceæ, and Roxburghia from Bomarea and Asparagus more decidedly than the features which I have chosen associate them, that feature must constitute a division prior to either epigynous or hexandrous, for the purpose of detaching them; but the best judgment that I can form, in the want of more precise information, is that such features are not to be depended upon for the separation of high grades, and are more fit to distinguish the suborders and sections.

The epigynous portion have all one triple style, which in some genera is tripartible and even occasionally tripartite. This division includes, with the plants usually called Amaryllideæ, the hexandrous part of Hæmodoraceæ, Hypoxideæ closely connected with them, Fourcroya and Agave, Dioscoreæ, Tameæ and others of which the present position cannot possibly be maintained. This epigynous division, constituting the order Amaryllidaceæ, separates itself into 1. Ramosæ, 2. Caulescentes, 3. Scapaceæ, or branching, caulescent, and scapaceous, meaning by a scape a succulent stalk supporting a spathed flower or umbel, and inarticulate below the spathe. Of the branching, there are but three known genera; the caulescent are, I believe, all schistandrous, i. e. having their anthers, which are bilocular or two-celled, opening by a vertical slit from top to bottom. They seem divisible however into Operculous and Nonoperculous. By operculous I mean having the base of the style which is enlarged, persistent after the decay of the rest, and forming a hollow top to the ovary, more or less prominent, and becoming part of the seed-vessel. The operculous may be called Hypoxideæ, and divided into 1. Hypoxidiform, 2. Lanariæform, covering the hexandrous part of the present Hæmodoraceæ, 3. Alstrœmeriæform; or those portions may form three suborders. The nonoperculous may be divided into Dioscoreæ and Agaveæ, the latter into Ixiæform and Agaviform. The scapaceous are divisible into Schistandrous, containing the true Amaryllideæ and Narcisseæ, and Porandrous of which the anthers open only by the upper part, which I call Galantheæ.

The hypogynous division consists of Liliaceæ, that is Asphodeleæ, Hemerocallideæ, Liliaceæ or Tulipaceæ according to the separations of different writers, Smilaceæ and Melanthaceæ. A portion of Melanthaceæ is clearly separable by posterior anthers, those with anterior anthers being improperly joined with them. The separation of Hemerocallideæ cannot be possibly maintained, the main distinction of the seminal integument being contrary to the fact, and the difference of a longer tube quite trivial for the character of an order. Smilaceæ, according to Dr. Brown's admission, are distinguishable from those which have been called berried amongst Asphodeleæ, only by the style being *oftener* tripartible, which, not being absolute, is no distinction. This hypogynous division, Liliaceæ, may be properly divided into suborders as the Amaryllidaceæ, and perhaps in this manner, Branching, Caulescent, and Scapaceous. Caulescent erect, Asphodeleæ. Caulescent twining, Smilaceæ, including asparagus medeola, &c. Scapaceous; anthers anterior, Allieæ; anthers posterior, Melanthieæ, the termination aceæ being reserved for the higher division. I can lay no great stress, except as a generic distinction, on the difference of seminal integument, when I look to the seeds of Leucojum and Galanthus, Pancratium and Hymenocallis, nor of capsule valved or valveless, which latter has been erroneously called a berry, when I look to Hæmanthus and Buphane, nor of erect and twining stem when I look to Bomarea and Alstrœmeria, all respectively confounded heretofore in genus; nor on the diœcious character, when I see one species of vitis diœcious and another not so; but they are features which may be available in inferior subdivisions though very little reliance can be placed on them. The fundamental principles on which I build may be thus briefly recapitulated. 1. There is a general point of agreement between all vegetables, namely, the character which separates them from the other portions of the creation. 2. As individual vegetables differ in a variety of points, those points taken singly will separate the mass, step by step, from the point of general agreement to that of individuality. 3. The only mode of avoiding confusion is to work downwards from the point of agreement to that of individuality. 4. Great attention is requisite in deciding which points of separation should have the priority. 5. That point should have the priority which shall be found not to separate (or, if that be impracticable, to separate the fewest) individuals connected either by a feature apparently more important, or by a prevailing weight of other features. 6. Each point must be taken singly, and contrasted with that which differs from itself, and not with some other feature consistent with it. 7. No point of difficult investigation should be put foremost, if one of more easy access is found to coincide with it. 8. The differences between the absence and presence of a feature being in many cases not absolutely defined, but intermediate appearances being found to intrude, there are but two ways of dealing with them, either to place them in an intermediate division, or in that to which they appear most nearly allied, stating them to differ through superfluity or defect; for instance, Commelina is an hexandrous plant, triandrous by defect; Azalea is a decandrous Rhododendron, triandrous by defect, and some species of Gethyllis and Vellosia are pleiandrous or more-stamened by superfluity. 9. Intermediate divisions, if adopted, are further separable by various modifications. 10. The Creator not having made all vegetables to differ from each other by any fixed number of points, but in the process of separation by distinct features, some being detached from the whole mass at an early and others at a later step, any system of arrangement that shall group them by an equal and fixed number of subdivisions or steps from the point of universal agreement, must be inconsistent with nature and fundamentally untrue. Therefore, if it be thought advisable for the purpose of assisting the memory to adopt any given number of principal divisions, such as class, alliance, group, order, suborder, and section, it can only be done with truth by admitting in each of those divisions an unlimited number of grades, and the determination of the number of grades at which a new division shall commence will be a matter of discretion and not of fact, and in truth of very little importance. 11. That the distinction of groups is of high value in shewing the harmony of the creation, but the basis of botanical labours is the discrimination of individual kinds. 12. That whatever names we may give to subdivisions, if one subdivision designates individuality, another cannot designate it also. 13. That the older botanists thought to designate individuality by the subdivision named species, and Jussieu said that in the discrimination of species the fundamental labour of the botanist consisted. 14. That it has since appeared by the further investigation of species, and by the experiments of horticulture, that in some very extensive* genera the species are diversities of one individual, capable of breeding together and frequently of producing fertile offspring, the fertility seeming to depend more on the constitutional, than the closer botanical, affinity of the parents; and that the species so proved to be one have the several diversities by which botanists have usually distinguished species from each other. 15. It follows, therefore, that individuality does not reside in the division named species by botanists, but in a higher division usually named genera. 16. That the individuality of other species, distinguished by like features, must fall with those whose individuality has been disproved. 17. That as individuality is proved to reside in the division usually called genera, it must reside there uniformly. 18. That there are but two ways of rectifying the great error of older botanists, either to confine the name genus to the point of individuality, or to change the whole nomenclature, and call the entire mass of genera (requiring, as they do, in either case, reformation in many instances), species, and the mass of species permanent varieties. 19. That the latter mode of proceeding would produce infinite disturbance, whereas the former requires nothing but the clear understanding and declaration of a fact, that individuality in the botanical divisions resides in the genus. 20. That there is no essential difference between species and permanent varieties; and that in some genera even cultivated varieties preserve themselves distinct in their generations more easily than natural species in others when approximated. 21. That in some genera intermediate diversities from different localities so confound the limits of species, that it is waste of words to argue whether a plant is a species or a permanent local variety; though it is a matter of convenience to assign some specific features, and to arrange the subordinate forms as varieties, but that the distinction of closely allied species is of very trivial importance; botanical species being merely the long established varieties of genus or kind, perhaps consequent on the dispersion of seeds by the deluge and referable to the unknown period when the different races of mankind assumed their peculiar appearance. 22. That the discrimination of an immutable generic feature is the discrimination of a fact, the limits of species and varieties are the offspring of human opinion. 23. That a mixed offspring from the mutual contact of any two plants, if not absolutely conclusive as to the identity of their origin, gives strong reason to presume it, and to doubt the validity of the features by which they may have been distinguished. 24. That the fecundity of such mixed offspring establishes the identity of kind.

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* Crinum, Hippeastrum, Gladiolus, Rosa, Pelargonium, Calceolaria, &c. If any one shall assert that Hippeastrum and Habranthus are not separate genera, but two species of one genus, and their respective species only varieties, the assertion is merely a different application of terms, but he who asserts it must concede on the other hand by analogy, that there is in that case only one species of rose, pelargonium, &c and that their reputed species are only varieties.

In framing the character of an order or genus, for the sake of perspicuity and correctness no feature should properly be included but such as are necessary to distinguish the order or genus from all others, and from which a departure would decidedly exclude a plant that should contravene it; and all important points that appear to coincide with the character should be added as observations subsidiary to it; nor will the system be perfected till each genus is separated from its nearest kin by a single primary and immutable feature, its subordinate peculiarities being subjoined. Perfection of the system cannot, however, be effected without a complete knowledge of the peculiarities of all the individuals which each order contains, and our ignorance of important points, even concerning those which are considered as having been described, presents an obstacle which can only be surmounted by time and assiduity. I doubt the correctness of any generic character which rests upon cumulative features, of which no one has sufficient weight by itself to distinguish and uphold it; and I think that no botanist has sufficiently considered what are the features that can be most depended upon in each order as indicating a diversity of kind. My own thoughts have been earnestly directed to that inquiry, but I feel my decision obstructed not only by the want of perfect knowledge of the natural order which I have attempted to arrange, but of the diversities of the whole vegetable kingdom. I am inclined to believe that every true generic character is manifested by, and therefore should be founded on, some difference of structure in the male or female constituents of the plant, the male being the perianth and stamens, the female the germen, ovary, style, and stigma, and of course the mature fruit. The difficulty is to ascertain which are substantial differences and which are only modifications of structure, and how far the points of structure which are invariable in the individuals of one race may be variable in another. Concerning this, which is the basis of botany, the opinion of its professors is fluctuating and undecided. Of late years their attention has been directed with great propriety to the fruit, but it has not been yet established in what an absolute diversity of the seed consists. The bent of my own opinion is, that the nearer to the base of either the male or female constituent any diversity manifests itself, the greater is its importance; and with great diffidence in making any suggestion on the subject, which I feel that I have not sufficient information to substantiate, and which, if it should prove to be upon the whole correct, will be assuredly subject to modifications or exceptions, I am nevertheless desirous of drawing the attention of botanists to its consideration. I look upon the perianth as superadded to the stamens, and therefore further from the base than the anthers. Under this view it would be apparent that the absolute disseverment of the base of the segments of the perianth (a point so entirely overlooked in botanical characters, that we cannot ascertain from the terms used whether the perianth is quite cleft or deeply cleft) is of more importance in framing a generic character than any difference in the form or position of its upper part; that the absence or presence of a tube is of more importance than the form of the limb, the stamen being of greater consequence than the perianth, to which the stamen is the interior and proper base. Under this view it would be apparent that the stigma is the least important part of the female constituent. The point concerning which I feel the greatest difficulty is the degree of weight which is to be assigned to a difference in the attachment of the anther, and exactly what variability of anther is consistent and what is inconsistent with identity of kind, and I believe it to be the most difficult point that botanists have to investigate. The insertion of the filaments appears to be of the highest importance, their more or less continued adhesion to the tube, when not absolutely inserted, to be of very little weight. Whatever may be the truth in these respects, it is evident that a distinct view of the relative importance of the several differences that exist between vegetables, in ascertaining their generic identity and in the disposition of natural groups, is the great desideratum to give stability and consistence to the labours of botanists.

On minute examination of the riches of the several herbariums which have been opened and entrusted to me by the liberality of their possessors, the difficulty of deciding whether or not to consider individual specimens as local varieties of one species, is greater than when a more perfect knowledge of their peculiarities is obtained from the sight of living plants. The mode in which I propose to surmount this difficulty is very simple, and I think its advantage will be felt, and that it will be universally adopted. I suggest that in every botanical work varieties should be specified as belonging to one of four characters, viz. 1. local; 2. accidental; 3. cultivated; 4. hybrid. 1. Varietas, *i. e.* var. loci; 2. var. fortuita; 3. var. hortensis; 4. var. hybrida. That the system of marking varieties by letters of the Greek alphabet (which the unlearned cannot read and pronounce, and when spoken give the very unsatisfactory names alpha, beta, gamma, &c.) should be abandoned as unmeaning and inconvenient, and each local permanent variety distinguished by a Latin name not found in that genus or in any other genus so nearly allied as to make their union not quite impossible, and that such name should agree grammatically with the generic name; and, further, that closely allied species should be placed in groups headed by their most striking features of agreement. It will then appear that it makes little difference whether they are looked upon as varieties of one or as several allied species, as their affinity will be equally shown and the peculiar name would stand the same in either case. Thus I find a race of Crinum, occupying the coast of South America, distinguished by a short column, a stoloniferous bulb, diverging leaves with a rough margin, flowers from 4 to 8, oftener 6, and cinerascent anthers, which were the features of

C. erubescens. It varies in different localities very much, and I call the varieties, 1. rubrilimbum, &c. 8. octoflorum. If any person thinks them more distinct than I do, he puts forward the name rubrilimbum or octoflorum, which at all times may be used alone for brevity, but the plant equally stands in its place with its affinities made evident. We have an American race with an ovate stoloniferous bulb, more erect leaves, and four flowers (rarely five), of which the first known was Americanum. This is followed by Commelini, strictum, and Loddigesi, more distinguished from each other than the varieties of erubescens, and therefore placed as species; but if intermediate plants shall be found to bind the connexion closer, they will stand with the same names as varieties 1, 2, 3, &c. following Americanum, the var. princeps, or first of the family. A very important objection to the naming permanent local varieties by either figures or letters, is that it forces their arrangement to be made according to priority of notice and not according to affinity, or if those of later introduction are inserted in their proper places, the distinguishing marks and titles will be ever varying. I therefore entreat all botanists who may have occasion to name any new species in the genera I am about to describe, not to give to it any name which I shall have affixed to a variety in the same or a closely allied genus. The distinction of local varieties by their place of abode, if surely ascertained, has great advantages, and the objection that they may, perhaps, be found in more situations is of no importance. I take this opportunity of cautioning all botanists against the introduction of any new species of Crinum, Hippeastrum, &c. without certain assurance of their being of wild growth in some specific place, because the hybrid varieties which have been raised by myself and others are innumerable, and from the multitude of species collected together now in the gardens at Calcutta, where I sent most of the hybrid as well as Occidental and African species, mules have lately originated there by accidental intermixture, and Dr. Carey found that he could no longer depend on the seed ripened in his garden. The accidental and cultivated are of a different character from the local varieties, and should have no Latin name, but be designated thus,—var. (fort. flore albo.) accid. fl. white, var. gard., fl. double, var. hybrid by ——. Very great confusion is produced by the nurserymen giving a Latin name to every garden seedling, and men of science should set their faces decidedly against the practice, which Mr. De Candolle very inauspiciously sanctioned with respect to hybrid plants. Where garden varieties are much multiplied florist names ought to be used, as with hyacinths, tulips, &c. Hybrid plants which are found of spontaneous growth in the wild abodes of their parents should rank as species marked Hyb. Sp. or spontaneous hybrid; those of complicated or uncertain intermixtures in our gardens should be marked as variety garden hybrid. It would very much tend to preclude confusion if all substantive genitive cases were abandoned to cultivators for the distinction of their varieties, and the names of all species and permanent local varieties confined to adjectives. With this view I venture to alter all the proper names adopted in this order to an adjective form, writing Caldasiana for Caldasi; and I earnestly press the convenience of this arrangement on the consideration of botanists, by which it may be understood at once that B. Caldasiana must be a species, or permanent local variety, and that B. Caldasi would designate a seminal or hybrid variety; and as it will be vain to urge nurserymen not to dignify their productions with Latin names, I wish to request them to confine themselves to genitive cases of proper names, names of romance or heathen deities, or of substances, as flammæ instead of flammeus, eboris instead of eburneus; and, if the botanical editors of popular periodical works will attend to this suggestion, we shall get rid of the overwhelming confusion which garden productions are creating. At present, in our best botanical catalogues, every seedling, Camellia Japonica, or Hippeastrum, is dignified with a Latin adjective name, and the endless garden intermixtures of Calceolarias are named like the natives of South America, very much to the disadvantage of science. Cultivators will have an ample fund of names if all genitives are given up to them, and the change of the few genitives that have been used in the scientific nomenclature into the form of an adjective will produce no inconvenience.

The kindred genera, also, of each order should be so arranged in different groups, having certain common features, that, if it should hereafter be found that two genera, now distinguished, are in fact identical, they would remain as sections of the leading genus without any disturbance of the arrangement or nomenclature. For instance, Phycella, Habranthus, and Zephyranthes, very dissimilar at their extreme points, touch very closely at the intermediate points of approach, but being properly grouped, if it should hereafter appear (which I do not think it ever will) that a Phycella can breed with a Zephyranthes, they will stand as three subgenera or sections of the leading genus without occasion for any further alteration than that of the word genus, subgenus, or section. Botanists are too apt to consider that they have discharged their part when they have carefully defined a plant; any accurate man can do this; but only half the duty of a botanist has been discharged before he has ascertained to what other plants his specimen is most nearly related, and by what points it is separated from them; and for that information we usually either look in vain, or find it stated with little consideration and correctness. I wish to see something more like sound system and regularity in our proceedings; and I protest against the custom of placing plants provisionally in any genus with which they are known *not* to accord. It would never have been done if any clear principles had been established for the construction of generic characters, and such cannot be adopted till it is clearly understood what a genus is.

I hope that nothing in these pages will be offensive to any of the distinguished cultivators of the science of botany, from whose steps I have found it necessary to depart. It has been my anxious wish to pursue, with careful deliberation, the path of accurate inquiry, without using any polemic expression, and without depreciating the writings or setting at nought the opinion of any individual. If, by misfortune, an abrupt expression shall have been any where incautiously admitted, I pray that it may be considered as an oversight, which, if observed, would have been sedulously rectified.

W. H. 1835.

POSTSCRIPT.

The foregoing preliminary treatise was prepared for the press last year, but was delayed for the purpose of instituting a particular investigation of the Narcissi and some other plants of which specimens could not be then obtained, and it would have been more satisfactory to myself to have delayed this work longer. I have, however, now had the advantage of looking into Dr. Lindley's second edition of a Natural System of Botany, a work of exceeding great value, which I hope will reach many editions, and be improved till it shall ultimately exhibit that distinct view of the vegetable creation which in the foregoing pages I was desirous of exciting him to produce. I observe with great pleasure at the commencement of the volume what is there termed an artificial analysis of the orders, in which the faulty system of a limited number of subdivisions is abandoned, and the successive grades of difference are set forth in the general manner I have suggested. It is termed an artificial analysis, as I conclude, because its author is conscious that it does not arrange the orders according to his own view of their affinities. He may be, however, assured that, if such be the case, it is not because such an analysis is necessarily repugnant to the most important affinities of nature, but because the principal points have either not been duly set forth, or have not obtained the precedence they deserved. It is impossible that any man should, at the first, bring such an arrangement to perfection. It is much to have begun the work, and to have produced an analysis which is of infinite value, both from the clear view which it presents and the facilities it offers for effecting a more perfect arrangement. What remains is to examine carefully how the points assumed and arranged therein separate orders that ought to be approximated, and to see how either by arranging those points in a different order of precedence, or by the assumption of other points, the analysis can be made to exhibit a more natural view of the concatenation of vegetables. The work will not be perfected till the arrangement made in such an analysis shall be the proper arrangement for the body of the work, to which I am sorry to find, though with some variation, that my former objections apply. There are alterations, which make some of the particulars of my foregoing observations not exactly applicable to the improved edition of this work; they were, however, by no means intended as criticisms, but as exemplifications of the mode of classification to which I objected. But, as the arrangement is in some respects different, it is incumbent upon me to examine very carefully what it contains concerning the Amaryllidaceous plants, and, indeed, the Monocotyledonous plants in general.

I find them divided at the outset into six groups:—1. Epigynous; 2. gynandrous; 3. hypogynous; 4. reticulately veined; 5. spadiceous; 6. glumaceous. In the first place, epigynous means simply having the ovary below the stamens; but the character given as an interpretation of it includes features of a different description, and the limitation, "ovary inferior or if superior then the leaves either scurfy or equitant," renders the division of *Group* 1 *ovary inferior*, and *Group* 3 *ovary superior*, nugatory. If the circumstance of the leaves being scurfy or equitant is of primary importance, it ought to be placed before the feature which is thus made subordinate to it: but the fact is, at least as I conjecture, that Dr. Lindley does not think it of primary importance, and, if so, it ought not to supersede and nullify the division he has made. The second group gynandrous being a portion of the epigynous group ought not to be contrasted with it, but made a subordinate division. The third group is characterized as having coloured ternary flowers, which has nothing to do with its title, ovary superior. The fourth makes a division according to the veins of the leaves, which I fear is not perfectly correct, and is loaded with the addition of very different features which are not peculiar to itself. The fifth and sixth are spadiceous and glumaceous, but I observe the spadiceous group does not contain all the palms, the true palms, though spadiceous, being placed in another group. The division, therefore, thus proposed of monocotyledonous plants into six groups seems liable to all the objections I felt to the adoption of the former arrangement. The point which principally concerns the immediate object of my labours is the order Hæmodoraceæ, which

Dr. Lindley proposes to preserve, and I have given the most unprejudiced consideration to his remarks on that subject. It is for the purpose of bringing Hæmodoraceæ and Bromeliaceæ into the group of plants with the ovary inferior, that the limitation of leaves equitant or scurfy has been devised to stand in lieu of the inferior ovary in plants which have the ovary superior, viz. equitant leaves to bring in the Hæmodoraceæ, and scurfy to include Bromeliaceæ. There is, however, no connexion between those two qualities of the leaf which are severally assumed, nor have either of them any relation to the quality of which they are made to compensate the absence; nor are they qualities generally belonging to the plants with which an association is to be effected through their means. Dr. Lindley says he is not aware that scurfy and equitant leaves are found amongst other plants with superior ovary. Undoubtedly they cannot be so found, if he takes out all that have them, but we have no other scurfy-leaved plants, and only one order with equitant leaves, in the group to which he has transferred them. Scurfy leaves or equitant leaves may be thought sufficient grounds for detaching plants from those which have them not, but not for superseding a more important point of difference. If the leaves standing edge to edge is of more consequence than the position of the ovary, we ought to have a primary division of leaves equitant and not equitant, but scurf, I think, could never be taken to characterize a high division. There seems to be no other feature than equitant leaves to separate the hexandrous epigynous Hæmodoraceæ from Amaryllidaceæ, for the equitation of the sepals is almost obsolete in Alstrœmeria, and I doubt its being absolutely wanting in Hæmodoraceæ; the woolly surface is a very weak feature, and their limb is not in fact smaller when compared with the tube than it is in some Cyrtanthi and Cooperia, supposing such a feature to be more important than I consider it to be. Taking, therefore, leaves equitant to be the true distinction by which it is proposed to hold together the discordant order Hæmodoraceæ, a very important question arises whether leaves equitant or standing edgeways with respect to each other, like those of Iris, instead of face to face, is a feature which ought to have general priority over the position of the ovary and the number of the stamens? The effect would be to sever Iridaceæ, which are defined as having leaves equitant, together with Hæmodoraceæ, from the hexapetaloid group at an early stage; but that separation having been made, we must, in order to preserve any consistency, either leave all those whose leaves are not equitant in one order, or we must divide the equitant upon the same principles as those with leaves not equitant; viz. into triandrous and hexandrous, epigynous and hypogynous, the result of which would be that Hæmodoraceæ would be equally broken up in the manner I had proposed to do, the only difference being that the hexandrous portion would be placed in closer affinity with Iridaceæ. It is, I think, evident that it would not be desirable to introduce this feature for the mere purpose of making that discordant association, unless it should appear to work well if applied as a previous limitation to all other monocotyledonous plants, which Dr. Lindley does not appear to have considered. But whatever might be the effect, I believe it is, like other peculiarities of leaves, too variable to be taken as a chief characteristic, for it is untrue with respect to Iridaceæ, the only other order which is said to have leaves equitant. The whole of the common bulbous Irises or Moræas have channelled leaves fronting each other like the Amaryllideæ with a cylindrical base. They can scarcely be called equitant in Crocus. It seems, like the reticulation of the veins in Dioscoreæ, which is not forthcoming in D. lucida, or like the plication of leaves, too uncertain to uphold an order or perhaps even a suborder, though it may be good as a generic characteristic. It appears to me, therefore, that it cannot be taken as a previous feature of separation, and that the hexandrous epigynous portion of Hæmodoraceæ must unite with the Amaryllidaceous plants in the first instance. I have distinguished them in such manner as I find consistent with the truth as far as I can ascertain it; and whether that portion so distinguished shall be considered as an order, or a suborder, or a section, is a matter of discretion concerning which I feel perfectly indifferent; but if it be made an order, other suborders of Amaryllidaceæ should be equally exalted, which I think will not be found convenient; indeed, I understand the use of the termination *aceæ* to have been adopted for the express purpose of including the suborders, and preventing an unnecessary multiplication of independent orders. The fact is, that all the bulbous Amaryllidaceæ have equitant leaves, though cylindrical at the base, instead of being compressed. The definition of the term by Jussieu is one leaf doubled enclosing another; every Amaryllidaceous leaf encloses another with its base, and some vaginate very high, but such base is usually cylindrical. When it is flattened, as if by compression, the true equitant form is exhibited; but the difference is the compressed habit, not the structure. I observe that Dr. Lindley calls leaves flat in contrast with equitant, which is an unsatisfactory term, since most of those so called flat are deeply channelled, and the others often really flat; but there is no true contrast, and therefore an applicable expression could not be found. If all leaves that enclose another with their base are properly equitant, the distinction of such would be, base compressed and base cylindrical, lamina edgeways and lamina confronted. It will even be found that some Iridaceous plants, as Homeria, have a compressed base with confronted leaves, bearing an intermediate form.

Dr. Lindley has associated Xerophyta, Vellosia, and Barbacenia, with Bromeliaceæ. It is impossible that a person embracing such a very wide field as an arrangement of the whole vegetable system, should have at the first under his view all the considerations which present themselves readily to one who is investigating a particular branch of that system, and I feel quite confident that my worthy friend on mature consideration will perceive that this cannot do. Bromeliaceæ had two definite and important features, ovary superior, and perianth tripetaloid, that is, having three conspicuous petals, and three short sepals like a calyx. Dr. Lindley, detaching Vellosia and Barbacenia from Hypoxideæ, and uniting Xerophyta with them, brings the order Bromeliaceæ out of its proper place to unite with them, and in so doing overturns its character. Its ovary is superior, and it is brought into the class with inferior ovary on account of its mealy leaves, but not one of those three genera to which it is brought has mealy leaves; and it cannot be understood how that feature is to stand in lieu of the other. It thus becomes necessary to engraft on the character of Bromeliaceæ an alternative which is fatal to it as a distinguishing character ("calyx *usually* calycine, *sometimes petaline*"), and entirely to drop the position of the ovary, which in other parts of the system is made conspicuous. I cannot too distinctly declare that nothing polemic is intended by my remarks; that I have no wish but to consider dispassionately how a satisfactory arrangement can be made, and to lend my humble aid to those who are more competent to effect it. After mature deliberation I do not see that I can improve the disposition made of those three genera in my MS. where they form the first suborder, being distinguished by branching stems. Whether as such they shall form a separate order is a discretionary point, of too little importance to deserve much discussion. I think it will be inconvenient to detach them so, and I am certain that, if it be done, the caulescent portion must make another separate order, and Amaryllidaceæ be confined to the scapaceous plants; but this would narrow, instead of enlarging, our views of the creation.

It is gratifying to me to observe, that although my arrangement of the monocotyledonous plants was made upon the principles which I have laid down, without any reference to that division made by Dr. Lindley, which he calls nixus or alliances denoted by the termination *ales*, when I subsequently examined my scheme to see how it would affect his alliances, it appeared to dissever but one, which I think he may perhaps abandon on further consideration, the union of the bright-petaled Xyris and its fellows with the grasses. The rushes seem to me more closely allied to the grasses than the plants which have some coloured petals; but the half-glumaceous orders stand in need of careful reconsideration. It is impossible, as I have before said, that any consecutive arrangement should exhibit a perfect concatenation of vegetables; but I have effected one in strict conformity with the principles I had previously laid down, and though of course it must be capable of improvement and rectification, when the plants it contains shall be more perfectly understood, it will be found that, proceeding systematically on those principles, I have disjoined fewer affinities than has yet been done by any of the existing arrangements, which are based on no fixed principle. For instance, Bromeliaceæ, which are chiefly epiphytes, find themselves next to the gynandrous epiphytes, where every cultivator would place them; and the gynandrous epiphytes to the Scitamineous plants, which have almost a gynandrous appearance; whereas, I find Bromeliaceæ placed by Dr. Lindley between the Irises and the aquatic frogbits which intervene between them and the other epiphytes. The closely allied Amaryllidaceous and Liliaceous plants, which are all called lilies by the unlearned, and are only separated by ovary inferior and superior, are brought in contact by my systematic arrangement, though

Dr. Lindley separated them by fourteen orders. The palms and pandanaceous plants, which the unlearned equally call palms, are brought together, though I find the liliaceous plants between them, and in that respect I think nature and my system appear to work well together. The aquatic frogbits find themselves by system, as if accidentally, next to the floating river plants, instead of intruding between Bromelias and other epiphytes. The breaking up of the order Hæmodoraceæ does of itself arrange the disjointed parts where their affinities are evident. In the position which I necessarily give to Gillesiaceæ, it becomes the point of contact between the liliaceous plants and those which advance from the grasses to meet them, so that it is almost immaterial on which side the line of division it is placed, whereas it connects nothing where it now stands. I find therefore the axioms, which I have laid down as the basis of the botanical science, work more satisfactorily in the detail than I could have anticipated before their application.

The circumstance that, working upon different plans, Dr. Lindley and I should have come so near to the same juxtaposition of certain orders as he has adopted in his alliances, though to a very different position of the alliances themselves, seems very confirmatory of the soundness of his views with respect to subordinate affinities, and on the other hand their agreement with my systematic arrangement of the whole must tend to uphold its propriety.

The arrangement which I have made is intended to enable any person, however little skilled in botany, understanding the terms used, which are explained in the glossary, to ascertain easily to what order any monocotyledonous plant before him belongs; but many of the orders are so unsatisfactory in their construction, so overlaid with alternatives which obstruct the view of their fundamental diversities, though the separation may be correct, that I have not the means of defining them by as satisfactory a feature as I should wish to do, and I can only take the best that has been found, or at least asserted, to be invariable.

W. H. 1836.

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1. Communis inter plantas omnes consentio est, quâ ab aliis rebus discrepant. 2. Singulæ quoniam variis qualitatibus discordant, qualitates singulæ catervas plantarum ab universis, singulas a catervis distinguunt. 3. Separandæ sunt gradatim universæ, dum singulæ singulis secernuntur. 4. Quibusnam qualitatibus in eâ discriminatione locus prior tribuendus sit, solicitè deliberandum est. 5. Ea qualitas anteferenda est, quæ plantas singulas qualitate aliquâ majoris momenti aut pluribus qualitatibus consentientes haudquaquam aut quàm minimè secernit. 6. Qualitas quæque singulatim qualitati a se diversæ objicienda est, minimè verò qualitati, quæ cum ipsâ consentire possit. 7. Ubi duæ qualitates diversæ semper associatæ esse videntur, ea ex duâbus quæ magis aspicienti est manifesta, potissimum sumenda est. 8. Qualitatis cujuslibet non semper absoluta est præsentia vel absentia; quamobrem formæ sunt intermediæ, quibus aut locus intermedius præbendus est, aut locus quàm maximè consentaneus superfluitate aut defectu laborantibus. Catervis plantarum locus intermedius magis idoneus; singulæ cum consentaneis, superfluitate vel defectu nonobstante, locandæ; ex. gr. Commelina hexandra est defectu triandra, Azalea Rhododendron decandrum defectu pentandrum vel heptandrum, Gethyllis et Vellosia hexandræ interdum superfluitate pleiandræ. 9. Formæ intermediæ aliis qualitatibus sæpe inter se discrepant. 10. Deus Creator plantis singulis inter se uno quodam certo qualitatum diversarum numero discrepare non dedit, sed aliæ priore, aliæ posteriore gradu ab universis in processu separationis secernuntur; unde quamlibet plantarum dispositionem, quæ divisiones universarum certo quodam graduum numero a puncto universæ consentionis deductas constituet, naturæ ipsi repugnare et mendacem esse necesse est. Idcirco si, memoriæ subveniendi gratiâ, numerus divisionum præcipuarum certus aliquis statuetur, uti classis, nixus, phalanx, ordo, subordo, et sectio, falsa erit ista dispositio, nisi in divisione unâquâque gradus convenientes absque certo numero præscripto constituantur;

parvique divisiones istæ præcipuæ momenti erunt, utpote ad libitum locatæ, non ex naturâ rei provenientes. 11. Ad harmoniam rerum creatarum demonstrandam perutilis est catervarum ordinatio; rei verò botanicæ præcipuum in plantarum singularum charactere vero et immutabili dignoscendo opus consistit. 12. Quodcunque nomen divisioni cuique velis assignare, verus singularum plantarum character in unâ divisione, non in diversis, existere necesse est. 13. In divisione, quæ vocatur species, character iste verus in generationum serie immutabilis, teste cl. Jussieu, sedere putabatur. 14. Ulteriore specierum investigatione experientiâque in studiis hortulanis nactâ, nuper innotuit, species in generibus quibusdam singulæ plantæ formas diversas præbere, utpote ex mutuo contactu progeniem eamque sæpe fecundam, parituras; et progeniei ista fecunditas *idiosyncraseos* in parentibus consentione, magis quàm ex affinitate botanicâ, oriri visa est; speciesque istæ, quibus hâc ratione characterem unum eundemque inesse probatum est, diversitates eas ipsas exhibent, per quas botanicorum mos est species universas secernere. 15. Speciebus idcirco omnibus supradicto modo discretis characterem immutabilem non tribuendum esse parili ratione probatum est. 16. Ergo non in divisione, quæ a botanicis species vocatur, sed in præstantiore illâ quæ genus nominatur, character individuus immutabilis positus est. 17. Si unquam ibi positus est, semper ibi positum esse necesse est. 18. Modi sunt duo, quibus error iste a botanicis admissus emendari potest; vel in generibus solis characterem individuum collocando, vel genera omnia (reformatis quæ reformari debent) pro speciebus, species pro varietatibus sumendo. 19. Maxima ex hôc turba, ex illo nulla orietur. 20. Nulla est inter species et varietates generatione continuatas differentia naturalis, inque generibus quibusdam varietates hortenses perfectiùs, quàm in aliis species, ubi juxta positæ sunt, generatione sincerâ se continuant. 21. In quibusdam generibus formæ plantarum variæ ex diversis regionibus ortæ specierum fines conturbant et commiscent, quamobrem vana et futilis est contentio, utrum speciei aut varietatis generatione continuatæ (fortuitis varietatibus exceptis) plantæ cuilibet nomen tribuendum est. 22. Character generis individuus immutabilis rerum factarum est discriminatio; specierum ac varietatum fines arbitrio humano constituuntur. 23. Ubi ex mutuo duarum plantarum contactu planta intermedia prognata est, ex unâ aliquâ stirpe primariâ parentes deductos fuisse, et characterem quo discreti fuerint invalidum esse, locus est suspicari. 24. Fecunditate plantæ istius intermediæ parentium origo una eademque esse probatur.

Sociis artis botanicæ fautoribus conclusiones hasce breves consectarias, rebus naturâ immutabilibus confidens, sibi diffidens, humiliter proponit.

GULIELMUS HERBERT.

Spofforthiæ, *A. D.* 1835.

MONOCOTYLEDONES.

Plants having but one seed-lobe; found also to increase their bulk by deposits in the centre, without the distinction of bark, pith, wood, and medullary rays.

1. SPADICEOUS.—Having a spadix; that is, flowers not petaloid, set round a stalk.

§. Involucrate.—Having an involucre below.

§§. *Ligneous.*—Flower-stem woody.

(*Palmales.* Lindley.)

Palmaceæ.—Spadix more loose or branched; 1-3-seeded.

(*Pandales.* Lindl.)

Cyclanthaceæ.—Flowers spirally arranged; many-seeded.

Pandanaceæ.—Flowers closely set; many-seeded.

§§. *Succulent.*—Flower-stem juicy.

(*Arales.* Lindl.)

Araceæ.—Flowers uni-sexual, petals wanting; excluding such aroid plants as have not an involucre.

§. Naked.—Wanting the involucre.

(*Typhales.* Lindl.)

Typhaceæ.—Flowers uni-sexual; sepals three or more, sometimes a bundle of hairs; petals wanting.

(*Piperales.* Lindl.)

Piperaceæ.—Flowers hermaphrodite. If retained amongst monocotyledones, but removed by Dr. Lindley to dicotyledones. Both these orders are hypogynous.

2. SUBSPADICEOUS.—Having a tendency to the form of an imperfect spadix, either by an inferior involucre or close-set spike, or flowers neither corolliform nor glumaceous.

§. Subcorolliform.—Having a tendency to a petaloid appearance in the flowers.

§§. *Epigynous.*—Having the stamens above the germen.

(*Narcissales.* Lindl.)

Taccaceæ.—An anomalous race, with an Amaryllidaceous scape, a perianth approaching to that of Tupistra, a tuber and foliage approaching to Arum.

§§. *Hypogynous.*—Having the stamens below the germen.

(*Araceæ.* Lindl.)

Orontiaceæ.—Anthers turned inwards; spathe none? Orontium, Tupistra, Aspidistra. This is an anomalous race of plants. Orontium and Tupistra are decidedly subspadiceous. Aspidistra and Tupistra are not truly petaloid, nor yet glumaceous, which is contrary to the habit of the exspadiceous plants, amongst which they would appear misplaced. If Aspidistra has really eight segments and four cells it must stand by itself, but it looks in the figure as if two of the segments were merely bifid at the point or 2-lobed. I venture, by analogy, to doubt the fact of Orontium having posterior anthers like Araceæ.

Acoraceæ.—Anthers turned inwards; spathe leaf-like.

(*Fluviales.* Lindl.)

Juncaginaceæ.—Flowers in spikes; seeds erect.

Naiadaceæ.—Flowers in spikes; ovules solitary, pendulous.

Pistiaceæ.—Flowers two, on the margins of the leaves.

§. Corolliform.—Having the semblance of petals.

§§. *Monoperianthine.*—Having a simple perianth.

§§§. *Tripetaloid.*—Having the semblance of three petals.

(*Hydrales.* Lindl.)

Hydrocharidaceæ.—With an inferior involucre.

§§§. *Hexapetaloid.*—Having the semblance of six petals.

(*Liliales.* Lindl.)

Pontederaceæ?—Flowers with a close spadix-like spike, or with an involucre. I am not acquainted with those said to have an umbel. This order, which is insufficiently described, belongs, perhaps, to Liliaceæ, or requires reformation. I place it here with doubt, not being thoroughly acquainted with it.

§§. *Biperianthine.*—Having a two-fold perianth.

(*Amomales.* Lindl.)

Zingiberaceæ.—Middle stamen fertile.

Marantaceæ.—One lateral stamen fertile.

Musaceæ.—Stamens irregularly abortive; flowers spathaceous.

3. EXSPADICEOUS.—Not having the form of a spadix.

§. Corolliform.—Having the semblance of petals.

§§. *Gynandrous.* —Having the style consolidated into a column with the stamens.

(*Gynandrales.* Lindl.)

Orchidaceæ.—Capsule 1-celled, 3-valved; seed-coat loose.
Vanillaceæ.—Fruit 1-celled, succulent; seed-coat tight.
Apostasiaceæ.—Style free from the stamens the principal part of its length, therefore less perfectly gynandrous; fruit 3-celled.

§§. *Agynandrous.*—Not having the style consolidated with the stamens.

§§§. *Tripetaloid.*—Having the semblance of three petals.

§§§§. *Monogynous.*—Having the semblance of one style.

(*Bromelales.* Lindl.)

Bromeliaceæ.—Sepals persistent; leaves rigid.

(*Commelales.* Lindl.)

Commelinaceæ.—Sepals leafy; leaves not rigid.

§§§§. *Pleiogynous.*—Having more or distinct styles.

(*Alismales.* Lindl.)

Butomaceæ.—Seeds numerous, attached to the internal surface of the fruit.
Alismaceæ.—Seeds 1-2, attached to the suture, at a distance from each other.

§§§. *Hexapetaloid.*—Having the semblance of six petals.

§§§§. *Triandrous.*—Having three stamens.

§§§§§. *Epigynous.*—Having the stamens above the germen.

(*Ixiales.* Lindl.)

Iridaceæ.—Anthers opening outwardly.

(*Narcissales.* Lindl.)

Burmanniaceæ. — Anthers opening transversely.
Hæmodoraceæ.—Anthers opening inwardly. Only the triandrous epigynous portion of Dr. Brown's order.

§§§§§. *Hypogynous.*—Having the stamens below the germen.

Wachendorfaceæ.—Anthers opening inwardly.

§§§§. *Hexandrous.*—Having six stamens.

§§§§§. *Epigynous.*—Having the stamens above the germen.

Amaryllidaceæ.—Anthers turned inwards.

Division 1. Ramosæ.—Branching.

Suborder 1. Xerophyteæ.—Schistandrous, *i.e.* anthers opening the whole length.

Division 2. Caulescentes.—With a stalk.

Suborder 2. Hypoxideæ. — Schistandrous; operculous, *i. e.* the base of the style forming a prominent top to the seed-vessel.

——— 3. Agaveæ. — Schistandrous; not operculous.

Division 3. Scapaceæ. — With a spathaceous scape.

Suborder 4. Amaryllideæ. — Schistandrous; petaline filaments excelling.

——— 5. Narcisseæ.—Schistandrous; sepaline filaments excelling.

——— 6. Galantheæ.—Porandrous, *i. e.* anthers opening partially.

(——— 7? Taccaceæ?—Filaments hooded; tuber and leaves arum-like.)

§§§§§. *Hypogynous.*—Having the stamens below the germen.

(*Liliales.* Lindl.)

§§§§§§. *Anthers turned outwards.*

Melanthaceæ.

§§§§§§. *Anthers turned inwards.*

Liliaceæ.

Veins not reticulate.

Suborder 1. Allieæ.—Scape with spathaceous umbel.

——— 2. Asphodeleæ.—Spike bracteate; leaves not succulent.

——— 3. Aloeæ.—Spike bracteate; leaves succulent.

——— 4. Tulipeæ; scape without spathe or bractes.

——— 5. Convallarieæ.—Having a rhizoma or creeping tuber.

Suborder 6. **Asparageæ.**—Stalk leaf-bearing.

Veins reticulate? Qu. whether always.

(*Retosæ.* Lindl.)

——— 7. **Smilaceæ.** — If not, they unite with asparageæ.

§§§§. *Subhexapetaloid.*—Having some of the six petaloid segments occasionally deficient.

Roxburghiaceæ.—Fruit 1-celled. An order not well established as now constituted; perhaps a section of Smilaceæ with reticulate veins, but Dr. Lindley gives an alternative which is fatal to it, viz. veins *reticulate* or *alternate.*

§. SUBGLUMACEOUS.—Having a tendency to scaly flowers. (all hypogynous)

(*Liliales.* Lindl.)

§§. *Hexandrous defective.*

Gillesiaceæ.—Perianth minute, surrounded with scales; seeds attached to the axis.

(*Glumosæ.* Lindl.)

Xyridaceæ.—Tripetaloid; anthers turned outwards. Placentæ parietal, *i. e.* seeds not attached to the centre of the fruit.

(*Juncales.* Lindl.)

§§. *Hexandrous.*

Juncaceæ.—Not tripetaloid; anthers turned inwards.

§§. *Triandrous.*

Philydraceæ.—Perianth two-leaved.

§. GLUMACEOUS.

(*Glumosæ.* Lindl.)

§§. *Ovules pendulous.*

Restiaceæ.—Placentæ central, *i. e.* seeds attached to the centre of the fruit. Anthers unilocular—anthers bilocular; perianth 2-6-parted or wanting. Requires reformation.

Eriocaulonaceæ.—2 segments anterior; 1 posterior or deficient.

§§. *Ovules not pendulous.*

Desvauxiaceæ.—Scape solid filiform; inflorescence spathaceous; fruit 1-seeded utricles.

Cyperaceæ.—Stems solid and angular; fruit crustaceous or bony.

Graminaceæ.—Stems fistular; fruit-coat membranous, scarce distinguishable from the seed.

The circle is completed by returning to the spadiceous division, of which the alliance to graminaceous plants is manifested by the approximation of calamus amongst the palms to bambusa of the latter.

Notwithstanding its unavoidable imperfections, I believe the foregoing arrangement will nearly enable any person who has no previous knowledge of botany, except understanding the terms used, to discover readily the natural order to which any monocotyledonous plant before him may belong. If my knowledge of all the individuals that compose those orders had been perfect, I should have distinguished each of them from others in the same subsection by one sure feature, the most obvious and easy to ascertain that could be found; and I should have subjoined in italics, as auxiliar, all other features that seemed to be invariable. But I have to deal with orders, some of which are inaccurately constituted, and require to be reformed, and of which important features have been either overlooked or but partially ascertained; and I have to wade through a long and unsatisfactory string of alternatives, from which no certain and invariable distinction can be elicited. I feel no hesitation in saying that all such characters require to be remoulded. Alternatives may severally head the sections of an order, but cannot together distinguish one order from another. For instance, the words "*tube short or long, limb flat or erect,*" furnish points for subdivision, but no point of distinction for the whole, except the existence of a tube besides the limb, which would be properly expressed by the words *perianth tubed.* In the character of the order from which those words are taken, I find, also, *embryo orthotropous, heterotropous, or antitropous,* from which it results, either that the order embraces things so dissimilar as to require reformation, or that the position of the embryo is immaterial; but such alternatives, presenting every possible position of the embryo, can furnish no peculiar distinction of the thing described, and are worse than superfluous, for they so encumber the real marks of separation, that it becomes almost impossible to discover them.

With respect to the suborders I suggest for Liliaceæ, it must be observed, that it is immaterial whether Melanthaceæ be erected into a separate order by the previous separation of anthers anterior and posterior, or considered as a suborder distinguished by that feature. It is equally a matter for future consideration, to ascertain whether all Smilaceæ have confluent veins, and, if it should appear that they have, whether it would be more consistent to separate them into an order distinct from the nearly allied Asparageæ on that account, or merely to distinguish them as a suborder. I am indebted to Dr. Brown for a sight of specimens of Dioscorea lucida, of which the numerous cross veins are long and beautifully parallel, though here and there one may be observed bifid at the point, but preserving its direction to the longitudinal rib, and never running into another cross-vein or retroflex. It is true that the fruit of that plant has not been seen, and, although from its aspect it can scarcely be doubted that it is a Dioscorea, it may prove to be distinct from that genus, of which I have examined fifteen species with confluent veins. But if it were so distinguished, its close affinity to those plants would not the less shew the insufficiency of the feature to characterize an order. I find, also, the cross-veins of Rajania quinquefolia to be parallel, though in an oblique instead of a rectangular direction. I am on the whole of opinion that the venation of leaves is not sufficiently invariable to furnish a sure character. I believe that a sound feature may be found in Inflorescence axillary and Inflorescence not axillary, to detach Dioscoreæ, Tamus, Smilaceæ, Asparageæ, and Roxburghiaceæ, from Amaryllideæ and Liliaceæ, before the subdivision into hypogynous and epigynous, thus—

§§§§. *Hexandrous.*
  §§§§§. *Inflorescence axillary.*
    §§§§§§. *Epigynous.*
      Dioscoreæ.—(With Tamus.)

    §§§§§§. *Hypogynous.*
      Asparageæ.—Veins parallel; fruit 3-celled.
      Smilaceæ.—Veins reticulate? fruit 3-celled.
      Roxburghiaceæ.—Fruit 1-celled.

  §§§§§. *Inflorescence not axillary.*
    §§§§§§. *Epigynous.*
      Amaryllidaceæ.

    §§§§§§. *Hypogynous.*
      Liliaceæ.

If the fact should prove to be correct, that the inflorescence of the plants proposed to be so detached is invariably axillary, I should certainly prefer that separation; but that distinction has never been noticed, and I am fearful lest it should not be supported by the fact.

I am aware that the foregoing arrangement is liable to the objection, that the spadix itself, being in its perfect form composed of more than one feature, does not fall precisely within my own limitation; and that strictly the flowers being apetaloid, set round a stalk, and involucrate, are three features which should be exhibited separately. Perhaps the following arrangement may be preferable:—

1. SPADICEOUS.—*Meaning thereby simply flowers set round a stalk.* §. PETALOID. §§. Biperianthine.—*Zingiberaceæ. Marantaceæ. Musaceæ.* §§. Monoperianthine.—*Pontederaceæ?* §. SUBPETALOID — *Orontiaceæ. Acoraceæ. Juncagineæ.* §. APETALOID. §§. Naked.—*Naiadaceæ. Typhaceæ. Piperaceæ?* §§. Involucrate. §§§. Ligneous.—*Pandanaceæ. Cyclanthaceæ. Palmaceæ.* §§§. Succulent.—*Araceæ.*

2. EXSPADICEOUS.—*Flowers not set round a stalk.* §. APETALOID. §§. Not glumaceous.—*Pistiaceæ.* §§. Glumaceous.—*Graminaceæ. Cyperaceæ. Desvauxiaceæ. Eriocaulonaceæ. Restiaceæ.* §. SUBPETALOID.—*Juncaceæ. Philydraceæ. Xyridaceæ: Gillesiaceæ. Taccaceæ?* §. PETALOID. §§. Agynandrous. §§§. Subhexapetaloid.—*Roxburghiaceæ?* §§§. Hexapetaloid. §§§§. Hexandrous. §§§§§. Hypogynous —*Liliaceæ.* §§§§§. Epigynous. AMARYLLIDACEÆ. §§§§. Triandrous. §§§§§. Epigynous.—*Burmanniaceæ. Iridaceæ. Hæmodoraceæ limited.* §§§§§. Hypogynous.—*Wachendorfaceæ.* §§§. Tripetaloid. §§§§. Pleiogynous.—*Butomaceæ. Alismaceæ.* §§§§. Monogynous.—*Hydrocharidaceæ. Commelinaceæ. Bromeliaceæ.* §§. Gynandrous.—*Apostasiaceæ. Vannillaceæ.* Orchidaceæ.—The circle returns to Zingiberaceæ.—It will be observed that Pistiaceæ seems to interfere between Palmaceæ and Graminaceæ, but the connexion is lateral between Araceæ and Pistiaceæ, Palmaceæ and Graminaceæ.

Araceæ.——Pistiaceæ.
Pandanaceæ.
Cyclanthaceæ.
Palmaceæ.—Graminaceæ.
Cyperaceæ, &c.

By a singular fatality in forming the character of Hemerocallideæ as a suborder, Dr. Lindley has also made an oversight concerning its seed-coat, which he defines to be pale and soft, though in truth it is dark glossy black and very brittle. That of Agapanthus is black also.

MONOCOTYLEDONES.

AMARYLLIDACEÆ.

Character.—Expadiceæ; corolliformes; agynandræ; hexapetaloideæ; epigynæ; hexandræ. [*Stylo triplici, antheris anticis.*] *Vel, si mavis;* Caulis aut scapus non spadiceus; germen inferum, nisi defectu, triloculare; perianthium corolliforme simplex hexapetaloideum; stamina sex, rariùs superfluitate numerosa; styli tres non staminiferi, sæpius consolidati, interdum adnati partibiles, rarissimè distincti.

Observationes.—Antheræ quoad novi, anticæ, biloculares. Stylorum cognatorum bases (ideoque stigmata, ubi stylus rectus est) lobique operculi in apice germinis costas sepalinas respiciunt; valvarum sutura costæ sepalinæ, dissepimentum petalinæ, continuatio est; dissepimentum placentæ medio incumbit, ideoque series binæ ovulorum in loculis singulis diversis placentis adhærent. Valvâ septigerâ inter costas sepalinas ademptâ, loculorum duorum pars dimidia apparet, ovulis, ubi cumulata sunt, divergentibus; pericarpii parte inter costas petalinas ademptâ, loculus integer patet, ovulis, ubi cumulata sunt, convergentibus. In Amaryllidacearum omnium seminibus (ni fallor) foramen chalazæ seu vertici oppositum est; embryonis radicula ad foramen spectat, numquam verè umbilico approximatur, nisi quòd vicinus sit foramini umbilicus; umbilicus inter foramen et verticem situs est; funiculus umbilicalis foramen attingit; quamobrem, ubi foramini contiguus est umbilicus, uti in Hippeastro, gracilior est funiculus; ubi remotus, uti in Curculigine, latior, spatium scilicet intermedium (quod cum umbilico ipso veriùs hilum nuucupatur, ab umbilico mero satis diversum) cooperiens. Ovula seminum testaceorum, quoad novi, ab axe rectè ferè procedunt (canali umbilicali ad verticem, quæ chalazæ regio est, circumlato, atque ibi cotyledoni subministrante); fecundata obliquantur, vertice declinato, foramine surgente. Ovula seminum carnosorum vel fune brevi forti crasso alliguntur atque in crescendo vix obliquantur, vel hilo latiore placentæ ipsi adnata esse videntur.

In Hypoxidiformibus et Galantheis, quoad novi, fila-

menta subæqualia sunt; in Alstrœmeriæformibus, et in Amaryllideis, ubi non subsequalia, petalina, in Narcisseis sepalina semper præstantiora sunt. Folia plerumque sunt paralelovenia; sed in latè ovalibus (ex. gr. in Crino petiolato, Griffiniâ, Urceolinâ) partim semipennivenia sunt, uti etiam in genere Costo inter scitamineas, venis multis a costâ mediâ oriundis; et Tamus cum Dioscoreis plerisque (sed non omnibus) venis bifidis confluentibus distinguitur. Plicatio foliorum vix, nisi inter Hypoxidiformes, invenitur, lusu naturæ excepto in Crino anomalo; Galanthi plicati non vera est plicatio, sed margo, uti in Amaryllideis quibusdam, magis verò conspicuè, retroflexus. Antheræ biloculares sunt; petalinæ et sepalinæ minutâ quâdam diversitate affiguntur. Antheræ præstantioris positio a me potissimùm designatur.

AMARYLLIDACEÆ.

Character.—Not-spadiceous, corolliform, not-gynandrous, hexapetaloid, epigynous, hexandrous.

Stalk or scape without a spadix *(meaning thereby flowers, which have not the semblance of petals, set round a stalk, and when perfect having an involucre below)*; germen inferior, and, unless by defect, 3-celled; perianth simple (*that is, as contrasted with the scitamineous plants*), having the semblance of six petals; stamens six, rarely numerous by superfluity; styles three, not bearing the stamens (*as contrasted with the gynandrous plants*), mostly consolidated, sometimes partibly adnate to each other, rarely separate.

Observations.—The anthers, I believe, in all the genera are 2-celled, and face inwards. The bases of the styles, and consequently the lobes of the stigma, if strait, and of the opercle on the summit of the germen, are opposite the ribs of the sepals; the sutures of the valves of the seed-vessel are continuations of the line of the sepaline, the dissepiments of the petaline, ribs. The valve, which bears the dissepiments between the lines of two sepaline ribs, being taken off, half of two cells is exposed, the ovules, when they are heaped, diverging; the portion of the pericarp between the line of two petaline ribs being taken off, an entire cell is exposed, the ovules converging. Unless I am deceived, in the seeds of all Amaryllidaceous plants the foramen is opposite to the chalaza or summit; the radicle of the embryo points to the foramen, but is never truly approached to the umbilicus, except because the umbilicus is near the foramen; the umbilicus is situate between the foramen and summit of the seed; the breadth of the umbilical cord reaches to the foramen, wherefore, if the foramen is near to the umbilicus, as in Hippeastrum, the cord is slender; if it is remote, as in Curculigo, wider, that is, occupying the intermediate space (which, together with the umbilicus, constitutes properly the hilum), more extensive than the mere umbilicus. The ovules of the testaceous seeds appear to me to proceed at right angles from the axis, the umbilical channel making a circuit by the line of the raphe to the summit, which is the region of the chalaza, and there furnishing nourishment to the cotyledon; and after fertilization the ovule appears to slope, the summit being lowered and the foramen proportionably elevated. The ovules of the fleshy seeds seem to be either attached by a short thick cord, or to adhere with a wider hilum to the placenta.

My own observations would lead me to believe that there is a very minute communication with the foramen, soon becoming obsolete, along the margin of the umbilical cord, but I have not had the use of a powerful microscope, and I cannot venture to dissent from the received opinions concerning the fertilization of ovules, though from their extreme improbability my understanding does not willingly yield assent to them.

First Division.—BRANCHING.

Suborder 1. Xerophytéæ.—Leaves rigid.

1. Xeróphyta. *Jussieu.*—Flowers terminal.

‡ *Flowers not terminal.*

2. Vellósia. *Vandelli. (Campderia. Kth. Raddia. Rich.)* —Perianth scarcely tubed; filaments sometimes numerous, superfluous.
3. Barbacénia. *Vandelli.*—Perianth tubed.

Second Division.—CAULESCENT.

Suborder 2. Hypoxidéæ.—Schistandrous, *i. e.* anthers opening their whole length. Operculate, *i. e.* the point of the germen superior, and forming a base to the style.

§. 1. HYPOXIDIFORMES.—Sepals and petals conformable; leaves plicate.

(Weldénia? *Schlechtendal.* If really a depauperated hexapetaloid epigynous plant, which I doubt.)

4. Curculígo. *Gaertner.*—Tube cylindrical upwards; anthers distant; seeds with a deep-gulphed hilum.
5. Molinéria. *Colla.*—Tube short; anthers fasciculate; seeds round.
6. Hypóxis. *Linnæus.* *(Fabricia. Thunb.)*—Perianth deep-cleft, patent in the sun, base annular.
7. Cœlánthus. *Schultes.*—Perianth campanulate conniving.

§. 2. LANARIÆFORMES.—Leaves equitant; sepals and petals conformable.

‡ *Perianth tubed.*

8. Anigozánthus. *La Billardiere.* *(Schwægrichenia. Spr.)*—Limb short, more deeply cleft on the lower side.
9. Lanária. *Aiton.* *(Argolasia. Jussieu).*—Limb regular.

‡ *Perianth deep-cleft.*

10. Lophíola. *Ker.*—Limb regular reflex; anthers versatile; style tripartible.
11. Conóstylis. *R. Brown.*—Limb regular, half expanded; style conical dilated.
12. Phlebocárya. *R. Brown.*—Anthers subsessile; style filiform.
13. Campynéma. *La Billardiere.*—Filaments recurved; anthers versatile; styles separate recurved.

§. 3. ALSTRŒMERIÆFORMES.—Sepals and petals not respectively uniform. Petaline filaments excelling.

‡ *Inflorescence umbellate.*

14. Chœradódia. *Herbert.*—Style strumous; capsule triangular. If it should prove not operculous it must be placed next before Doryanthes.
15. Alstrœméria. *Linnæus.*—Valves of the capsule opening from the bottom. (*Stalk erect.*)
16. Collánia. *Herbert.*—Pericarp pulpaceous; more than half the ovary superior. (*Stalk rigid, umbel nodding.*)
17. Sphærine. *Herbert.*—Ovary but little superior; capsule indehiscent. (*Stalk tapering, flexuous.*)

18. Bomárea. *Mirbel.*—Capsule dehiscent from the top. (*Stalk twining.*)

Suborder 3. Agavéæ.—Schistandrous, not operculous.

§. 1. Dioscoreæformes.—Spikes (I believe always) axillary. Obs. *Veins of the leaves generally confluent; plants diœcious, climbing.*

19. Támus. *Linnæus.*—Fruit with outer coat valveless, middle coat pulpaceous, inner coat 3-valved bearing the dissepiments,

‡ *Capsule valved; seeds flat, shelly.*

20. Testudinária. *Salisbury.*—Filaments inserted in the base of the segments.

21. Dioscoréa. *Linnæus.*—Filaments inserted in the disk. N. B. If that distinction does not hold good, testudinaria must probably fall into Dioscorea. The statements as to the fact are contradictory.

‡ *Capsule one-seeded, with a long curved wing.*

22. Rajánia. *Linnæus.*

§. 2. Ixlæformes.—*Root bulbous.*

23. Bravóa. *La Llave.* (*Cætocapnia. Link et Ot.*)—Inflorescence spiked; flowers tubular.

24. Ixiolírion. *Herbert.*—Flowers deep-cleft; stamens perfect.

(Tecophiléa? *Bertero.*—Flowers deep-cleft; stamens three fertile, three abortive. *I believe this to be a truly triandrous plant belonging to Iridáceæ.*)

§. 3. Agaviformes.—Semibulbous or stemmed.

‡ *Inflorescence spiked or branching.*

25. Fourcróya. *Ventenat.*—Perianth not tubed; style strumous.

26. Agáve. *Linnæus.*—Perianth tubed; style filiform.

‡ *Inflorescence umbellate.*

27. Doryánthes. *Correa.*—Perianth tubed.

Third Division.—SCAPACEOUS.

Scape succulent, spathaceous, not articulate below the spathe.

Suborder 4. Amaryllidéæ.—Schistandrous, not operculate. Petaline filaments, unless equal, excelling.

† Cavæ.—*Scape hollow; seeds compressed with a black shell, capsule 3-celled 3-valved.*

§. 1. **Cyrtanthiformes.**—Tube wide-mouthed; germen oval, pedunculated. African.

28. Cyrtánthus. *Aiton.*—Tube curved; filaments strait, decurrent.

29. Gastronéma. *Herbert.*—Tube curved; filaments conniving, three bent downwards.

30. Vallóta. *Herbert.*—Tube strait, filaments strait adnate.

§. 2. **Hippeastriformes.**—Tube narrow-mouthed; germen wider above, constricted in the middle. Occidental.

‡ *Perianth declined, tubeless.*

31. Sprekélia. *Heister.*—Connexion annular; filaments fasciculate declined.

‡ *Perianth declined; tube abbreviated and faucial membrane deficient on the lower side.*

32. Hippeástrum. *Herbert.*—Limb with fourfold disparity.

‡ *Perianth declined; tube not abbreviated.*

33. Phycélla. *Lindley.*—*Perianth convolute into the form of a tube; anthers incumbent; faucial membrane, when manifest, equal.

34. Habránthus. *Herbert.*—Perianth not convolute; anthers incumbent, versatile, attached by the middle; faucial membrane annular; leaves hiemal.

A. The upper sepaline filament prolonged; two or more-flowered.

B. Upper sepaline and lower petaline filaments abbreviated; 1-flowered.—Or a distinct genus, Zephyrítes? *Herbert.*—To be further investigated.

‡ *Perianth suberect.*

35. Zephyránthes. *Herbert.*—Filaments of alternate length, inserted at the base of the segments, patent, a little conniving; anthers linear, attached below the middle, suberect; pollen oval; flowers expand in the sun; lobes of the stigma patent.

Argyrópsis? *Herbert.*—Anthers erect, after inversion subulate and spirally twisted at the point; lobes of the stigma erect; pollen irregularly shaped.

‡ *Perianth erect.*

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* Eustephia (Cavanilles) must be expunged; no such plant will be found. It seems to be a species of Phycella, of which the description is unintelligible, and the accompanying figure repugnant to all probability.

36. Coopéria. *Herbert. (Sceptranthes. Graham.)*—Tube erect, cylindrical, wider at the mouth, limb stellate in its prime; anthers inserted at one-third from the base, fasciculate; stamens inserted, with little alternate variation, at the mouth of the tube. Flower (Qu. whether always) nocturnal.

37. Pyrolírion. *Herbert.*—Tube cylindrical; limb campanulate, with reflex points; filaments erect, patent.

38. Haylóckia. *Herbert.*—Filaments conniving, sepaline inserted in the base of the limb, petaline higher. (*Germen subterraneous.*)

† Solidæ.—*Scape solid.*

‡ *One-flowered.*

§. 3. Oporanthiformes.—Perianth without cup;—seeds testaceous?

39. Gethýllis. *Linnæus.*—Tube long, cylindrical, consolidated with the lower part of the style; filaments inserted at the mouth of the tube, sometimes superabundant. (*Germen subterraneous.*)

40. Sternebérgia. *Kitaibel.*—Tube cylindrical; style free; capsule 3-valved; seeds black. (*Germen subterraneous.*)

41. Oporánthus. *Herbert.*—Tube short, somewhat funnel-shaped; filaments inserted equally within its mouth.

‡ *Many-flowered.*

42. Lapiédra. *Lagasca.*—Perianth stellate, deep cleft; seeds smooth, angular. Scape supposed solid.

§. 4. Pancratiformes.—Cup staminiferous.

‡ *Seeds black shelly.*

43. Tapeinánthus. *Herbert.*—Perianth deep cleft; cup short; scape supposed solid.

44. Chlidánthus. *Herbert.*—Only the rudiments of a cup; membranous wings to the filaments, adhering to the perianth; tube long, cylindrical, widened at the mouth; limb semipatent.

45. Clinánthus. *Herbert.*—Membranous wings to the filaments, free, contiguous (if not united at the base?) tube long funnel-shaped, limb short.

46. Urceolina. *Reichenbach. (Urceolaria. Herb. App. Collania. Schultes.)*—Tube short, cylindrical, pendulous; limb ventricosely campanulate; sup-

posed by me to have some rudiments of a cup, from its evident affinity to Leperiza. If it has not, it must follow Lapiedra.

47. Leperíza. *Herbert.*—Tube strait subcylindrical pendulous, cup short.

48. Carpódetes. *Herbert.*—Germen erect, tube curved slender cylindrical, limb subcampanulate; cup short.

49. Cobúrghia. *Sweet.*—Germen rather drooping; tube long curved cylindrical, enlarged upwards; limb regular half patent; cup tubular.

50. Stenomésson. *Herbert. (Chrysiphiala. Ker.)*—Tube nearly strait, constricted in the middle, ventricose upwards; limb short regular; cup short.

51. Eucrósia. *Ker.*—Tube declined; cup declined, abbreviated on the upper side, shovel-shaped; limb compressed, curved upwards.

52. Eliséna. *Herbert.* (*Liriope Herb. App.*)—Tube cylindrical; limb reflex; two segments sloped downwards; cup sloped.

53. Pancrátium. *Linnæus.*—Tube cylindrical strait, cup conspicuous, limb patent, anthers short suberect.

A. Subsessile; seeds compressed, black, foliaceous; leaves persistent.

B. Pedunculated; seeds roundish, harder shelled. Genus ? Hálmyra. *Salisbury.*

C. Sessile; leaves deciduous, fruit unknown. Asiatic. Genus ? Tiaranthus. *Herbert.* if the seeds prove to be fleshy, as stated by Rheede.

‡ *Seeds fleshy, green; tube cylindrical.*

54. Hymenocállis. *Salisbury.*—Limb reflex; tube strait; filaments erect, a little conniving; anthers long, attached at a point below the middle, versatile, pendulous; seeds large oblong.

55. Chorétis. *Herbert.*—Tube nearly strait; limb reflex; filaments erect conniving; anthers long, attached by a callosity above the middle, pendulous from the first; seeds shorter, oblong.

56. Isméne. *Salisbury.*—Tube curved; filaments conniving, deflex; anthers long, attached below the middle; seeds round.

(Callitháuma ? *Herbert.*—Limb patent; cup about equal; filaments exceeding.)

57. Calostémma. *R. Brown.*—Limb strait, half patent suberect; cup sometimes split; filaments erect; anthers short, erect; germen usually 2-seeded, the dissepiments obsolete.

58. Vagária. *Herbert.*—Cup imperfect, 6-cleft to the base; limb substellate; seed unknown.

59. Eurýcles. *Salisbury. (Proiphys. Herb. App.)*—Limb strait; filaments erect; anthers erect; dissepiments imperfect; ovules protruding the embryo.

§. 4. **Amaryllidiformes.** — Scape solid; seeds fleshy; stamens not connected by a cup.

60. Griffinia. *Ker.*—Tube declined cylindrical, limb reflex, lower segments divaricate, lowest projected.

61. Lycóris. *Herbert.*—Tube declined, wider at the mouth, curved upwards; limb curved upwards.

62. Clívia. *Lindley. (Imatophyllum. Hooker.)*—Germen pendulous; perianth curved on the upper side only, with four-fold disparity of limb; fruit valveless, with pulpaceous middle coat.

63. Hæmánthus. *Linnæus.*—Tube strait, perianth regular; fruit valveless, with pulpaceous middle coat.

64. Búphane. *Herbert.*—Tube strait, perianth regular; capsule 3-valved, dry; ovules attached by a cord.

65. Ammócharis. *Herbert.*—Tube strait, perianth regular; capsule not pulpaceous; ovules adnate to the edge of the placenta; anthers short.

66. Crínum. *Linnæus.*—Germen thicker in the middle; tube slender, cylindrical; fruit soft, valveless; dissepiments becoming obsolete; anthers long.

67. Amarýllis. *Linnæus.*—Tube narrow-funnel-shaped; petaline filaments inserted at the base of the segments, sepaline lower; capsule obovate.

68. Brunsvígia. *Heister.*—Tube short or none; perianth and filaments recurved; capsule 3-cornered turbinate.

69. Neríne. *Herbert.*—Limb reflex, base annular; filaments equally adnate, with a gibbous monadelphous base; style filiform; anthers incumbent.

70. Strumária. *Jacquin.*—Base of limb annular; filaments connected at the base, all or alternately

often adnate to the lower part of the style; style strumous; anthers incumbent.

71. Hesséa. *Herbert.*—Tube short, limb regular; filaments equal, subulate, reflex; anthers short, erect; style filiform.

72. Imhófia. *Herbert.*—Perianth deep cleft, patent; style thick or strumous; filaments inserted at the disk.

73. Carpolýza. *Salisbury.* *(Hessea. Bergius.)*—Tube short, funnel-shaped; limb half-patent; filaments adnate; style thick, sulcate.

Suborder 5. Narcisséæ.—Scapaceous, schistandrous, not operculate; sepaline filaments excelling; cup including them.

74. Corbulária. *Salisbury.*—Tube and cup funnel-shaped; style and filaments declined, recurved; sepaline inserted at the base, petaline adnate near the base of the tube; anthers short, attached at the middle, incumbent, versatile. (Cup longer than the tube)

75. Ajax. *Salisbury.*—Style strait, subulate; filaments strait, adnate to the lower part of the tube; anthers linear, strait, attached below the middle, after inversion inveloping the top of the filament. (Cup longer than the tube)

76. Ganymédes. *Salisbury.*—Style strait, slender; filaments adnate to the upper part of the tube more unequally than in Queltia, and the sepaline more prolonged; limb decidedly reflex. (Cup not exceeding the tube)

77. Quéltia. *Salisbury.*—Style strait, more or less attenuated upwards; filaments adnate unequally to the upper part of the tube; anthers linear, affixed below the middle, recurved, margins meeting at top above the filament, but not enveloping it. (Cup not equal to the tube)

78. Narcíssus. *Linnæus.*—Style strait, slender; filaments straight, free at the point only, adnate unequally at and near the mouth of the tube; anthers attached below the middle, short, suberect, point recurved, margins not meeting behind. (Cup near four times or more shorter than the tube)

79. Hermíone. *Salisbury.*—Style strait, slender; filaments conniving free at the point only, adnate unequally at and near the mouth of the tube; anthers acute oval, attached at the middle, incumbent. (Cup shorter than the tube)

Suborder 6. Galanthéæ.—Scapaceous, porandrous (*i. e. anthers opening partially*), not operculate.

§ 1. Scape solid; seeds white or greenish.

80. Galánthus. *Linnæus.*—Sepals and petals dissimilar; anthers apiculate, opening at the top; style filiform, tapering.

81. Acis. *Salisbury.*—Sepals and petals a little dissimilar; anthers not apiculate, opening at the side near the top; style filiform, attenuated upwards; stigma a little divided.

82. Erinósma. *Herbert.*—Sepals and petals similar; anthers not apiculate, opening at the top; style clavate; stigma triangularly acuminate.

§ 2. Scape hollow; seeds black with a loose shining shell.

83. Leucójum. *Linnæus.*—Segments nearly equal; anthers dehiscent laterally from the terminal orifice, but not to the base; style clavate; stigma acuminate.

Suborder 7? Taccacéæ?—With aroid tuber and leaves; filaments hooded at top, longer than the anthers.

Referred by me to the subspadiceous plants, believing the perianth not to be truly petaloid; but I have never seen its flower. It has an evident affinity to Orontiaceæ.

Tacca. *Linnæus.*—Perianth regular persistent; filaments inserted at the base of the segments, dilated below; anthers adnate within the hood; ovary 1-celled, with three parietal polyspermous placentæ.

Atáccia? Prezl.

Divisio Prima.—RAMOSÆ.

Subordo 1. Xerophyteæ.—Schistandræ.

1. Xerophyta.—Perianthium tubatum limbo regulari persistente; filamenta basi laciniarum inserta; antheræ longæ lineares subsessiles; stigma ob-

longum dilatatum; capsula scabra trilocularis polysperma. (Genitalia recta?) *Planta suffruticosa ramulis alternis vaginis foliorum deciduorum imbricantibus scabra, foliis uti in pinu rigidis acutis, in apice ramulorum confertis, floribus terminalibus subsolitariis. Ex insulâ Madagascar. Specimen Commerson.*

2. Vellosia.—Per. campanul. vix tubat. (stam. interdum 12-15-18-24, phalangibus 3-6 connata) filam. brevia, anth. erectæ; (pollen globosum?) stylus rectus tripartibilis; capsula trilocularis trivalvis valvis in vertice horizontalibus vel imperfectis; sem. quadrata cuneata testâ simplici chartaceâ. *Fide cl.* Martii, mihi ignota. Plantæ Brazilianæ, Yuccæformes.
3. Barbacenia.—Germen erectum; perianth. continuum tubatum limbo reflexo; filamenta bifida antheris adnatis longiora; stylus acuminatus stigmatibus longior; sem. parva numerosa, compressione irregularia, testâ badiâ albo marginatâ.

Divisio Secunda.—CAULESCENTES.

Subordo 1. Hypoxideæ.—Schistandræ; operculatæ.

§ 1. Hypoxidiformes.—Sepala petalis conformia; folia plicata.

Weldenia? si verè epigyna hexapetaloidea depauperata, quod vix credo.

Perianthium tubulosum erectum, limbo patente tripartito; filamenta tubi fauci inserta, alterna breviora; antheræ erectæ, fundo inter loculos affixæ; stylus filiformis erectus; stigma trigono-capitatum. *Fide cl. Karwinsky, mihi ignota. Superumne germen an inferum, sepalane an petala abortiva sint, nescio.*

4. Curculigo.—Germen erectum, ferè subterraneum, bracteatum; tubus stylo accretus, superne cylindricus; limbus regularis patens; filamenta brevia ori tubi inserta; antheræ erectæ distantes; semina nigra pendentia, funiculo crasso albo sinum grandem intra umbilicum et foramen replente.

5. Molineria.—Folia longè petiolata; caulis apice curvatus capitulatus multiflorus; germen nutans bracteatum; tubus stylo accretus brevis, limbus regularis patens; filamenta brevia ori tubi inserta; antheræ erectæ fasciculatæ (monadelphæ?) semina nigra rugosa rotunda. *Nomen a Collæ hort. Rip. mutuatus sum. Species seminibus sine processu laterali procul dubio distinguendæ sunt.*
6. Hypoxis.—Germen erectum; perianthium profundè fissum basi annulari, sub sole patens, persistens; filamenta brevia subulata disco inserta; antheræ sagittatæ erectæ intra lobos affixæ; stylus brevis usque ad operculum trisulcus tripartibilis; stigma breve erectum fimbriatum; capsula trivalvis valvis ab operculo transversè disruptis; superne dehiscentibus, infra conjunctis; semina parva nigra foramine apiculato, umbilico minutissimè rostrato.

   Genera duo sub Hypoxide latere suspicor, alterum bulbo foliisque annuis, alterum persistentibus.
7. Cœlanthus.—Scapus folio complicato vaginante ferè totus inclusus pauciflorus; germen sessile, limbus (sexfidus?) campanulatus connivens; filamenta basi laciniarum inserta *Genus obscurum fide Schlechtendal in Reliq. Willd. specie unicâ, patriâ ignotâ.*

§. 2. LANARIÆFORMES.—Sepala petalis conformia; folia equitantia.

8. Anigozanthus.—Perianthium tubulosum tubo curvato limbo infernè profundiùs fisso laciniis subæqualibus infernè distantibus, filamenta basi dilatata flexa brevia ore tubi inserta; antheræ erectæ adnatæ; stylus curvatus deciduus; stigma clavatum; capsula 3-locularis operculo dehiscente; semina numerosa obovata nigra.
9. Lanaria.—Perianthium tubatum persistens, limbo regulari; filamenta basi laciniarum inserta; antheræ versatiles; capsula trilocularis loculis 2-3-spermis.
10. Lophiola.—Perianthium limbo profundè fisso regulari reflexo; filamenta erecto-patentia; antheræ oblongæ reclinatæ; stylus usque ad operculum tripartibilis, stigma simplex; operculum præ-

grande, capsula ovato-pyramidata, trilocularis loculis biseriatim polyspermis.

11. Conostylis.—Perianthium limbo profundè fisso, regulari, semipatente, persistente; filamenta brevia erecta; antheræ erectæ; stylus conico-dilatatus cavus tripartibilis persistens; stigma breve; capsula operculo dehiscente; semina numerosa.

12. Phlebocarya.—Perianthium profundè fissum persistens; filamenta basi laciniarum inserta; antheræ tetragonæ subsessiles; stylus filiformis; stigma simplex; ovarium defectu uniloculare trispermum; capsula corticata monosperma.

13. Campynema.—Per. profundè sex-fidum persistens; filamenta laciniarum basi inserta recurva; antheræ versatiles; styli (nisi potius stigmata sint) distincti recurvi; capsula trilocularis tripartibilis apice introrsum dehiscens; semina numerosa complanata testâ spongiosâ.

§. 3. Alstrœmeriæformes.—Sepala petalis nonconformia; filamenta petalina præstantiora.

14. Chœradodia.—Sepala et petala valdè disparia; stylus strumosus; capsula trigona. *Planta radice fibrosâ, foliis radicalibus majoribus, caulinis minoribus, caule alto umbellato multifloro; flores albucæ habitu, fide cl. Molinæ.*

15. Alstrœmeria.—Germen ovulis suberectis sexcostatum (superne 12-angulare 12-costatum) perianthium sexpartitum laciniis quater disparibus, petalis duobus erectis imo porrecto; filamenta ubi matura recurvata, glandulis in disco deciduis inserta, laciniarum basi vix adnata tardiùs distincta, petalina basi acutè ovali sepalina ultra-semicirculari discum signantia; antheræ basi affixæ; stylus recurvus; capsula oblongo-rotunda acutè operculata sexcostata valvis crustaceis septigeris dissilientibus axe ab imâ parte trifariam disrupto, costarum dimidio inseparabiliter pedunculo adhærente; semina subrotunda testâ tuberculatâ difficulter separabili, hilo lævi, chalazâ circulari, endopleurâ ab albumine corneo inseparabili.

Plantæ occidentales caule (quoad novi) erecto folioso vel squamato pedunculis 1-*plurifloris bracteatis, radice tuberosâ palmatâ.*

16. Collánia.—Caulis rigidus erectus apice curvatus; folia rigida? germen pendulum turbinatum, operculo ad basin styli tardius maximè amplificato; perianthium sexpartitum sepalis petalisque disparibus sub-tubiforme inter se paribus; filamenta et stylus recti; antheræ basi affixæ; pericarpium parte majore operculosum (molle? pulpaceum? edule?)

17. Sphærine.—Caulis rectus superne attenuatus; folia subrigida; (pedunculi uniflori?) perianthium sexpartitum breve sepalis petalisque disparibus inter se paribus; (filamenta recta?) antheræ basi affixæ; (stylus rectus?) capsula oblongo-rotunda indehiscens. (Semina pulpâ paucâ?) Plantæ occidentales (caule solitario?)

18. Bomárea.—Caulis volubilis; germen trigonè turbinatum; perianthium sexpartitum sepalis petalisque disparibus inter se vix disparibus; filamenta glandulis in disco deciduis inserta laciniarum basi vix aut nequaquam adnata; antheræ basi affixæ; capsula evalvis coriacea trigonè turbinata sexsulcata operculo obtuso, serius corrugata dissepimentis integris operculo latè dehiscente; semina obovatè subrotunda pericarpio maturo longùm adhærentia exopleurâ molli (semperne rubrâ aurantiacâ vel aureâ?) sarcopleurâ pulpaceâ, endopleurâ subfuscâ albumini corneo adhærente, chalazâ internâ annulari in endopleurâ conspicuâ, extus vix discernendâ.

Plantæ occidentales radice plus minus tuberosâ; stylo nescio an semper tripartibili.

Subordo 3. Agaveæ.—Schistandræ non operculosæ.

§. 1. Dioscoreæformes.—Spica axillaris. *Venæ foliorum accuratiùs inspiciendæ sunt. Plantæ scandentes, dioicæ.*

19. Tamus.—Perianthium profundè fissum, regulare, patens, in feminis supra germen coarctatum. Pericarpium exopleurâ evalvi, sarcopleurâ pulpaceâ, endopleurâ valvis septigeris; semina albumine corneo, ferè ut Alstrœmeriâ.

20. Testudinaria.—Perianthium profundè fissum, regulare, semipatens; filamenta basi laciniarum

inserta; pericarp. membranac. valvis septigeris. Semina complanata testâ obscurâ. *Plantæ Africanæ meridionales radice quadratè angulosâ.*

21. Dioscorea.—Perianthium sex-partitum (laciniis toro modioliformi in disco insertis *teste Salisbur. Parad. Lond.* 75) filamenta toro inserta alterna interiora, *teste Salisb.* laciniarum basi, *teste Brown; (utri credendum est? D. bulbiferâ ab utroque designatâ)* stylus in feminis profundè trifidus; ovarium 3-loculare loculis 2-3-spermis; capsula loculis 2 quandoque abortientibus.

Si reverâ species sunt Dioscoreæ in quibus filamenta laciniis perianthii inseruntur, ad Testudinariam transferendæ sunt, filamentis in Dioscoreâ toro modioliformi insertis. Si in omnibus filamenta laciniis, uti cl. Brown prædicat, inseruntur, Testudinaria radice quadratè angulosâ vix a Dioscoreâ, nescio quâ aliâ ratione, secernitur.

Observ.—*Vellem characterem Tamiformibus et Dioscoreæformibus ex foliorum venis sumere, cùm in Tamo communi et Dioscoreis plerisque præcipuæ bifidæ sint, confluentes, et reticulatæ; contra verò in Diosc. lucidâ simplices.*

22. Rajania.—Perianthium semipatens profundè fissum, supra germen in feminis coarctatum; capsula alata monosperma, loculis ovulisque cæteris abortientibus. Capsula monosperma alâ magnâ curvatulâ. Semen subrotundum. *Perianthium basi indivisum esse intelligo. Pessimus est botanicorum mos perianthium profundè fissum sexfidum aut trifidum dicere; meliora sperare fas est.*

§. 3. Ixiæformes.—Radix bulbosa (*pericarpium non pulpaceum; semina albumine corneo, testâ durâ?*)

23. Bravoa, *v. s.*—Caulis spicatus bracteatus; germen oblongum subtrigonum; perianthium cylindricum ore tubi ampliato, limbo laciniis brevissimis subconniventibus, alternè minoribus, persistens; filamenta fundo tubi inserta, filiformia; antheræ versatiles; stylus incrassatus; stigma triquetrum; capsula oblonga trilocularis trivalvis; semina duplici serie numerosa reniformia.

24. Ixiolirion, *v. s.*—Caulis pedunculis axillaribus vel terminalibus bracteatis 1-2-floris; germen ob-

longum erectum; perianthium profundè fissum (sexfidum non credo) regulare semipatens laciniis alternis æqualibus; filamenta recta basi laciniarum inserta, alterna æqualia; antheræ versatiles; stylus rectus; capsula oblonga striata trilocularis trivalvis; semina numerosa ovali-oblonga.

Tecophilea? *v. s.* Radix parva bulbosa pyriformis indusiis filamentosè membranaceis, folia 1-pauca, caule 1-paucifloro, germen oblongum, perianthium profundè fissum (regulare? semipatens?) filamenta 3 fertilia, 3 abortientia, sterilia. Teste cl. Bertero. Nescio an filamenta unquam perfecta. Credo equidem potius plantam esse ex Irideis verè triandram processibus tribus interstamineis. Filamenta non vidi, neque innotuit utra sint abortiva, petalina an sepalina.

§. 3. Agaviformes.—*Semibulbosæ vel caudicales, seminibus complanatis testâ nigrâ vel subfuscâ. (filamentis æqualibus?)*

25. Fourcroya.—Bulbus imperfectus aut caudex longævus; germen oblongum infra attenuatum cernuum; perianthium sexfidum regulare subpatulum laciniis alternis æqualibus; filamenta brevia subulata basi obovatè incrassata disco inserta conniventia; antheræ versatiles; stylus rectus cavus triqueter infra strumosus stigma trigonum fimbriatum; capsula oblongo-ovalis 3-valvis 3-locularis, semina nigra numerosa. *An prorsus sexfidum perianthium sit, inspicias.*

26. Agave.—Bulbus imperfectus vel caudex longævus; perianthium tubatum limbo non patulo; filamenta tubo adnata filiformia longa; antheræ longæ versatiles; stylus triquetro-filiformis; capsula utrinque attenuata 3-valvis 3-locularis; semina nigra numerosa.

§. 1. Germen cylindraceo-oblongum, pedunculatum horizontale; limbus infundibuliformis; filamenta fauce tubi inserta; stigma capitatum vix lobatum. Genus Chloropsis? Spec. lurida. Bot. Mag.

§. 2. Germen ovale sessile subhorizontale; limbus revolutus; filamenta basi laciniarum inserta; stigma inconspicuum. Genus Littæa? Spec. geminiflora.

§. 3. Germen oblongo-ovale perianthium erectum vel assurgens limbo filamentis adpresso; stigma trilobum lobis emarginatis. Genus Agave? Spec. Virginica. *In speciebus diversis flores et fructus accuratiùs inspiciendi sunt.*

27. Doryanthes.—Bulbus imperfectus, longævus; caulis capitulatus bracteatus; perianthium deciduum tubatum (*fide cl. Schultes et fig. Bot. Mag. tacentibus cl. Sims et Brown*) infundibuliforme laciniis subæqualibus reflexis; filamenta subulata basi laciniis (et tubo?) adnata; antheræ longæ erectæ basi extinctoriiformi affixæ; stylus trisulcus; stigma trigonum; capsula turbinatè ovata 3-locularis 3-valvis; semina subfusca foliaceo-rugosa.

DIVISIO TERTIA.

Scapaceæ; *i. e. scapo carnoso succulento spathaceo, infra spatham non articulato.*

Subordo 3. AMARYLLIDEÆ.—*Schistandræ, non operculosæ.*

† Cavæ; filamentis petalinis præstantioribus. Scapus cavus; semina compressa testâ nigrâ; capsula trilocularis trivalvis.

§. CYRTANTHIFORMES.—Germen ovale, pedunculatum, perianthium tubulosum tubo ampliato laciniis alternè æqualibus. *Plantæ Africanæ.*

28. Cyrtanthus.—Germen pendulum aut declinatum, tubus curvatus, filamenta recta decurrentia tubi parte superiore inserta, sepalina vix profundiùs, antheræ tertiâ parte superiore affixæ suberectæ; stylus incurvatus. A. foliis persistentibus. B. foliis deciduis.

29. Gastronema.—Germen declinatum, tubus infra curvatus gracilis cylindraceus, superne amplus campanulatus, laciniæ breves reflexæ, filamenta decurrentia conniventia, superiora tria longiora incurvata, petalina summo sepalina medio fere tubo inserta, antheræ breves, stylus declinatus petalo imo adpressus. *Foliis deciduis.*

30. Vallota.—Germen erectum, tubus rectus amplus, limbus infundibuliformis, filamenta conniventia latere tantum tubo (petalina summo tubo vel laciniis, sepalina profundiùs) adnata; antheræ

tertiâ parte inferiore affixæ suberectæ; stylus declinatus. *Foliis persistentibus.*

§. 2. Hippeastriformes.—Germen trigonum superne latius medio constrictum; tubus arctus. *Plantæ occidentales.*

1. Sprekelia.—Per. pedunculatum declinatum tubo subnullo laciniis superis reflexis inferis devexis basi convolutis; filamenta pariter membranâ connectente ad basin perianthii inserta, fasciculata, resurgenter (uti stylus) declinata, e petalinis summo e sepalinis imo cæteris longiore; antheræ a tertiâ parte superiore pendulæ. (*Stigma trifidum*)

32. Hippeastrum.—Per. pedunculatum declinatum tubo infra obliquè abbreviato, sepalo summo latiore, petalo imo angustiore; membrana faucialis, ubi manifesta, non annularis, (infra scil. imperfecta,) filamenta resurgenter declinata tubo gradatim inserta, e petalinis imo breviore profundiùs, e sepalinis summo longiore altiùs inserto; antheræ a tertiâ parte superiore pendulæ; stylus resurgenter declinatus. (Stigma trifidum aut trigonum)

33. Phycella.—Per. tubiforme, tubo brevi laciniis convolutis apice reflexo; membrana faucialis, ubi manifesta, æqualis; filamenta alternè æqualia summo tubo pariter inserta decurrentia apice recurvata; antheræ breves incumbentes; stylus devexè porrectus, (stigma dilatatum apice fimbriato)

Eustephia. Delenda, utpote falsò delineata diagnosi pessimâ. Nunquam talis invenietur. Proculdubio Phycellæ species mendosissimè depicta et descripta.

34. Habranthus.—Per. declinatum breviter tubatum subcampanulatum laciniis alternè subæqualibus; membrana faucialis annularis; filamenta summo tubo pariter inserta resurgenter declinata fasciculata; antheræ medio affixæ incumbentes; stylus resurgenter declinatus. (Stigma trifidum; capsula turbinata.) A. Subbi-pluriflorae filamento sepalino summo longiore. B. Uniflorae filamento sepalino summo petalino imo sociis bre-

viore. — Si constanter, genusne diversum, Zephyrites? mihi, ulterius inquirendum est.

35. Zephyranthes. (Scapus uniflorus?) Per. suberectum plus minus tubatum laciniis sub sole patentioribus alternè subæqualibus; filamenta pariter basi laciniarum inserta conniventia alternè longiora; antheræ lineares infra medium affixæ suberectæ; pollen ovale læve; stylus aversus. A. Polline ovali lævi, antheris linearibus stigmate trifido patulo. B. Pollen difforme scabriusculum, antheræ erectiores post inversionem subulatæ apice recurvis, stylus aversus, stigma lobis erectis; (folia crassa cylindrica persistentia) *species* candida. Misceri, ut videtur, nequeunt. Genusne diversum, Argyropsis? mihi, ulterius inquirendum est.

36. Cooperia.—Germen erectum; per. tubulosum tubo cylindrico erecto (fauce nudâ?) limbo (sub nocte?) patente laciniis alternis æqualibus; filamenta subæqualia apice libera, a fauce tubi pariter decurrentia; antheræ erectæ non versatiles tertiâ parte inferiore affixæ, fasciculatæ; stylus erectus; pollen difforme. (Stigma obtusè trilobum; spatha univalvis; scapus uniflorus; folia linearia tortilia)

37. Pyrolirion.—Per. erectum tubulosum tubo cylindrico limbo ventricosè campanulato laciniis apice patentibus alternè æqualibus; [filamenta (longa) fauce tubi inserta æqualiter patentia? antheræ a parte superiore pendulæ?] stylus suberectus. (Stigma trifidum; germen oblongum, sessile; scapus uniflorus)

38. Haylockia.—Per. tubulosum, tubo cylindrico, limbo semipatente laciniis alternè æqualibus; filamenta conniventia (brevia) laciniis, sepalina profundiùs, inserta; antheræ medio affixæ, incumbentes; stylus erectus. (Stigma trifidum; germen subterraneum; capsula turbinato-rotunda; semina dorso rotundato; folia linearia)

† Solidæ, scapo solido.

§. 3. Oporanthiformes. — Scapus solidus; perianthium non coronatum. Semina testacea?

39. Gethyllis.—Per. tubulosum tubo recto cylindrico

(sæpius partim subterraneo) limbo subæquali stellato; filamenta subulata erecta tubo prope faucem inserta a senis usque ad numerosa superflua; antheræ sagittatæ erectæ superne (plerumque?) spiraliter flexæ; stylus filiformis erectus inferne cum tubo consolidatus; capsula pulpâ eduli trilocularis; semina parva rotunda. *Plantæ Africanæ.*

40. Sternebergia.—Per. tubulosum tubo erecto cylindrico (sæpe partim subterraneo) limbo semi-patenti; capsula trivalvis; semina nigra nitida punctata. (strophiolata?). *Africanæ, Europeæ.* filamenta filiformia, basi dilatata, erecta, alterna longiora; stylus superne crassior; stigma bilobum.

41. Oporanthus.—Per. tubatum tubo erecto brevi subinfundibuliformi, limbo semipatente laciniis alternis æqualibus; filamenta tubo pariter prope faucem inserta, (scapus uniflorus; spàtha univalvis; germen sessile ovale complanatum rectum; ovula subrotunda compressione angularia magaritacea) semina testâ nigrâ? *Europeæ.*

42. Lapiedra.—(*Ex conjecturâ meâ scapo solido, seminibus testaceis; si carnosis, post Carpolyzam locanda erit.*) Scapus pluriflorus; spatha 2-3-phylla; per. stellatim patens regulare; filamenta erecta; antheræ sagittato-hastatæ (incumbentes? *fide Lagascæ*) semina parva angularia *fide Clusii. Si porandra esse invenietur, post Leucojum statuenda erit.*

§. 4. Pancratiformes.—Corona staminifera.

A. *Semina testâ nigrâ.*

43. Tapeinanthus.—Perianthium profundè fissum, corona brevis, filamenta patentia, antheræ breves incumbentes, stylus erectus; (clavatus?) stigma obtusum. *Planta bulbo pyriformi, foliis gracillimis, scapo præcoce spathâ monophyllâ.* Tacente cl. Cavanillesio, dubia est scapi soliditas.

44. Chlidanthus.—Per. tubulosum tubo cylindrico trigono recto superne ampliato, limbo regulari semipatente; filamenta apice incurvo libera, membranâ tenui dentibus sex alternè inæqualibus tubo et petalorum parti inferiori adnatâ inserta, antheræ prope basin affixæ; stylus rectus: ovula

multa opaca complanata biseriatim cumulata vix imbricantia. Stigma trifidum, patens.

45. Clinanthus.—Per. tubulosum tubo infundibuliformi (declinato?) limbo regulari brevi vix semipatente; filamenta brevia subæqualia acuminatè alata (basi cohærentia coronâ perfectâ? vel certè contigua) antheræ basi affixæ erectæ. (Germen subrotundum trisulcum; folia linearia)

46. Urceolina.—Germen pendulum ovatum trisulcum; tubus rectus subcylindricus; limbus ventricosè campanulatus; stigma dilatatum; semina plura nigra. (Folia lata petiolata.) Observ. *Coronam plùs minùs perfectam inesse ex scapo solido seminibus nigris et mirâ Leperizæ affinitate conjicio, cui tamen nomen Crinum a cl. Ruiz datum repugnat. Si nulla inerunt coronæ vestigia, post Oporanthum ponenda erit; si corona fuerit, a Leperizâ vix diversa invenietur; unde si genera consolidanda sint, nomen Urceolina anteferendum est.*

47. Leperiza.—Germen pendulum ovatum trisulcum; tubus rectus subcylindricus, limbus ventricosè campanulatus; corona brevis; stigma dilatatum; semina plura oblongo-subrotunda. (Folia lata petiolata, bulbus ovatus)

Bulbum tunicis imperfectis squamæformibus et filamenta sinuosè flexa esse ex fig. Flor. Per. non ex Ruiz. text. apparet. Figuram, ut sæpe in Flor. Per. mendacem esse puto.

48. Carpodetes.—Germen erectum pedunculatum; tubus curvatus gracilis cylindricus, limbus subcampanulatus, corona brevis, capsula obovata trisulca medio constricta; semina magna. (Folia linearia, bulbus oblongus)

49. Coburghia.—Germen ovale trisulcum pedunculatum subcernuum; per. tubulosum tubo curvato cylindrico superne ampliato, limbo brevi regulari semi-patente; filamenta æqualia sub-recta vix conniventia, corona tubata, antheræ rectæ, stylus recurvatus, stigma obtusum; ovula biseriatim confusa. (Folia linearia; bulbus ovatus)

50. Stenomesson.—Tubus sub-rectus medio constrictus superne ventricosus, limbus brevis regularis, corona brevis, filamenta recta, antheræ incum-

bentes; capsula latè ovata trisulca trivalvis basi valde ampliatâ. (Folia lanceolata margine compresso; bulbus subrotundus)

51. Eucrosia.—Tubus declinatus, anticè abbreviatus; limbus sursum curvatus compressus; corona declinata concavo-rutelliformis basi cylindricâ erectiore; filamenta infra dilatata complanata; antheræ a tertiâ parte superiore pendulæ polline minore; stigma dilatatum complanatum; capsula ovata trisulca. (Folia lata petiolata; bulbus latè ovatus)

52. Elisena.—Per. tubatum tubo cylindrico, limbo reflexo laciniis duabus depressis; corona declinata (imâ parte staminifera summâ filamenta labro comprehendens?) genitalia declinata recurvata; antheræ breves incumbentes.

53. Pancratium.—Per. tubulosum tubo cylindrico laciniis patentibus; corona conspicua; filamenta rigidula conniventia; antheræ breves sub-erectæ. (Stigma simplex vel trigonam; flores albi, extus subvirescentes)

A. Subsessiles, foliis persistentibus; semina testacea complanata dorso rotundato margine foliaceo hilo albo. B. Peduculatæ foliis deciduis; scapus superne cavus; semina oblongo-rotunda testâ duriore, raphe albicante. Genus Halmyra. *Salisbury*. C. Sessiles; foliis deciduis. Seminibus nondum aspectis dubito an genus sint a cæteris decernendum, cùm cl. Rheede in H. Mal. semina Catulli polæ albicantia carne albicante aqueâ scripserit; si verè, genus mihi Tiaranthus.

B. *Semina carnosa, integumento molli inseparabili.*

54. Hymenocallis.—Per. tubulosum, tubo recto angulatè cylindrico, laciniis longis linearibus angustis patulis; filamenta gracilia distantia subconniventia; antheræ longæ lineares versatiles a tertiâ parte inferiore pendulæ; pollen reticulatum scabrum; germen sessile vel breviter pedunculatum angulatum ovulis suberectis; semina viridia oblonga capsulam immaturam sæpe rumpentia. (Folia persistentia; bulbus et folia simul ex semine oriuntur)

55. Choretis.—Tubus cylindricus subrectus, laciniis et

coronâ patulis; filamentis distantibus sub-erectè conniventibus; antheræ callositate quâdam in parte superiore affixæ pendulæ; semina oblongo-rotunda (glaucescentia?)

56. Ismene.—Tubus curvatulus cylindricus, laciniis angustis linearibus patulis; filamenta conniventia (tria superiora in coronam plerumque deflexè curvata) antheræ modicæ; semina viridia rotunda. (Bulbus ovatus; folia æstiva decidua; bulbus semine maturo mox ortus non ante æstatem sequentem folia protrudit)

Callithauma?—Non satis notum. Bulbus cylindraceo-oblongus; limbus patens; corona lacinias æquans; stamina exerta. Spec. P. viridiflorum. Flor. Per. Ex bulbo cylindraceo-oblongo palmari, scapo orgyali, nectario enormi, flore smaragdino, generibus notis non convenire fretus sum. Vera generis indicia latent.

57. Calostemma.—Tubus brevis costatus, laciniis subæqualibus semipatentibus; corona sæpe fissa; filamenta brevia erecta; antheræ brevia erecta; stylus gracilis sensim attenuatus; stigma minutum; germen costatum, defectu sæpe biloculare; capsula dissepimentis obsoletis unilocularis 1-2-sperma; semina viridia rotunda, latere uno compressione complanato.

58. Vagaria. *(Vix Calostemmatis sectio secunda.)*—Tubus subcylindricus angulatus; limbus substellatus laciniis lanceolatis; filamenta dentatè alata coronæ sexties fissæ speciem referentia; stylus subulatus superne tenuissimus curvatulus; stigma parvulum. (Germen oblongum non costatum; folia linearia dorso convexo; stigma trifidum?) *Spec. Panc. parviflorum, patriâ ignotâ. Redoutè.*

59. Eurycles.—Tubus subcylindricus; limbus brevis laciniis lanceolatis; corona sæpius imperfecta sexties fissa, filamentis basi alatis; antheræ erectæ basi affixæ; semina rotundata bulbo ante maturitatem (vel in ovulis) protruso. (Germen dissepimentis imperfectis; folia æstiva decidua, petiolata, latissima)

§. 4. AMARYLLIDIFORMES.—Scapus solidus; semina carnosa.

60. Griffinia.—Tubus declinatus cylindricus; laciniæ reflexæ, inferiores divaricatæ, ima porrecta; filamenta cum laciniis pariter in tubum coalescentia, decurrentia, divaricata, recurvata; antheræ incumbentes versatiles; stylus recurvatus ante maturitatem devexus; ovula parallelo-erecta, obovata, latere exteriore erosa; semina obovata nitida albescentia chalazâ fuscâ. (Folia lata, petiolata; stigma simplex; pedunculi in seminando curvati)

61. Lycoris.—Tubus obsoletè trigonus ampliatus, sursum ad faucem curvatus; laciniæ sursum curvatæ; filamenta cum laciniis pariter in tubum coalescentia, recurvata, alterna æqualia; stylus recurvatus; stigma acutum circumfimbriatum; ovula subrotunda. (Folia linearia; capsula et semina non visa; capsula certè trivalvis)

62. Clivia.—Germen pendulum; per. superne incurvatum, infra rectius; tubo cylindrico ampliato; laciniis quater disparibus; genitalia recta, filamenta alternè æqualia, tubo pariter decurrentia; pericarpium evalve exulcum coloratum sarcopleurâ molli pulpaceâ (spatha plurivalvis; folia lorata rigida persistentia; semina obovata hyalina; bulbus imperfectus fibris carnosis).

63. Hæmanthus.—Per. regulare tubo recto; filamenta tubo summo inserta, recta; antheræ breves, suberectæ; stylus rectus attenuatus; pericarpium evalve exulcum [loculis monospermis dissepimentis obsoletis, sæpe coloratum] sarcopleurâ molli pulpaceâ. (Stigma lobis tribus vel obsoletis; spatha 3-multivalvis; semina hyalina)

64. Buphane.—Tubus cylindricus; limbus regularis; filamenta extra tubum inserta recta distantia; stylus rectus; ovula distincta; capsula turbinata, trilocularis, trivalvis, trisulca. (Stigma simplex; semina plura; viridia? spatha bifolia)

65. Ammocharis.—Tubus trigonè cylindricus ore ampliato (sepalorum marginibus non imbricantibus) limbus regularis; filamenta pariter ferè ad laciniarum basin tubo adnata declinata recurvata; antheræ breves medio ferè affixæ; stylus declinatus recurvatus; ovula biseriatim latere pla-

centæ intermediæ adnata (semina, quæ vidi, difformia, pollinis particulæ Crini polline dimidio minores; stigma simplex; folia basi non tubulosa.)

66. Crinum.—Germen medio crassius; tubus cylindricus germine gracilior; filamenta vix extra tubum pariter inserta recurvata, antheræ incumbentes; pericarpium molle evalve exulcum, dissepimentis obsoletis; semina difformia. (Folia basi tubulosa)

67. Amaryllis.—Germen trigonè obovatum; tubus angustè infundibuliformis, laciniæ reflexæ; filamenta petalina petalorum basi sepalina profundiùs tubo adnata; capsula trilocularis trivalvis obovata (præcociter sæpius disrupta) semina subglobosa. (Folia hiemalia, sub-linearia, arcuata, scapus autumnalis, multiflorus, pedunculis divaricatis)

68. Brunsvigia.—Germen trigonum; tubus brevis aut subnullus, perianthium et genitalia recurvata; filamenta tubo annulari adnata; capsula trigonè turbinata trilocularis trivalvis; semina subrotunda. (Folia hiemalia, lata, recumbentia; scapus autumnalis multiflorus pedunculis divaricatis; spatha lata)

69. Nerine.—Tubus subnullus annularis; laciniæ reflexæ; filamenta basi gibbosâ monadelphâ laciniarum basi adnata. (Folia lorato-linearia; scapus autumnalis; pollen minus; stigma demum trifidum)

70. Strumaria.—Tubus subnullus annularis, filamenta basi inter se connata, stylo plerumque vel omnia vel alterna adnata; antheræ incumbentes; stylus strumosus angularis sulcatus; semina pauca subglobosa. (Umbella multiflora pedunculata; spatha bivalvis; folia lorato-linearia; stigma trifidum.)

71. Hessea.—Tubus brevis, limbus regularis semipatens; filamenta æqualia subulata, erecta dein reflexa, fauce tubi inserta; antheræ breves erectæ basi affixæ; stylus filiformis. (Folia lorato-linearia; spatha bifida; umbella multiflora pedunculata; germen parvulum, mox præcociter inflatum turbinatum)

72. Imhofia.—Perianthium patens; filamenta ad basin perianthii (germini ipsi?) inserta subæqualia; stylus crassus vel strumosus, trisulcus; antheræ breves erectæ basi affixæ; semina viridia angularia dorso rotundato. (Folia filiformia; scapus autumnalis)

73. Carpolyza.—Perianthium tubo brevi infundibuliformi laciniis semipatentibus; filamenta toti tubo adnata; antheræ oblongæ, erectæ, basi affixæ; stylus crassus sulcatus superne tenuior; capsula trilocularis trivalvis; semina viridia dorso rotundato. (Stigma trifidum reflexum fimbriatum; folia filiformia)

Subordo 5. Narcisseæ.—Scapaceæ; schistandræ; non operculatæ; filamentis sepalinis præstantioribus coronâ inclusis.

Observ.—*Scapus plùs minùs superne fistulatus infra medullâ repletus; pedunculi solidi; semina testâ nigrâ; coronæ, ubi triloba est, fissuræ præcipuæ costis sepalinis, loborum crenæ petalinis, oppositæ; sepala, ubi disparia (semper, ni fallor) petalis latiora; ovula* 2-4 *seriebus sæpius imperfectis confusis; stylus sæpe tripartibilis, casu aliquando tripartitus.*

74. Corbularia.—Stylus ut filamenta declinatus recurvatus; sepalina basi tubi inserta, petalina prope basin adnata; antheræ medio affixæ, breves, versatiles. (Tubus et corona infundibuliformes. Corona tubo longior)

75. Ajax.—Stylus rectus subulatus; filamenta recta tubi parti inferiori adnata; antheræ infra medium affixæ longæ, lineares, marginibus retroflexis filamentum summum cooperientes. (Corona tubo longior)

76. Ganymedes.—Stylus rectus gracilis; filamenta tubi parti superiori inæqualiter adnata; (majore quàm in Queltiâ disparitate, sepalina magis producta) limbus absolutè retroflexus. (Corona tubo vix aut non longior)

77. Queltia.—Stylus rectus superne attenuatus; filamenta tubi parti superiori inæqualiter adnata, recta; antheræ lineares recurvatæ marginibus

summis retro concurrentibus filamentum summum non cooperientes. (Corona tubo brevior)

78. Narcissus.—Stylus rectus gracilis, filamenta recta apice tantum libera, inæqualiter tubo ad et prope faucem adnata; antheræ infra medium affixæ breves suberectæ apice recurvatæ marginibus non concurrentibus. (Coronâ tubo quater ferè brevior)

79. Hermione.—Stylus rectus gracilis, filamenta apice tantum libera conniventia, inæqualiter tubo ad et prope faucem adnata; antheræ medio affixæ acutè ovales incumbentes. (Corona tubo brevior)

Subordo 6. Galantheæ.—Porandræ; non operculatæ; scapaceæ. (Germine pendulo, filamentis æqualibus; polline minutissimo)

§. 1. Scapus solidus; semina subalbida.

80. Galanthus.—Perianthium sexpartitum sepalis concavis, petalis brevioribus emarginatis; filamenta libera germinis toro inserta subulata; antheræ erectæ basi affixæ, poris terminalibus, reflexè apiculatæ. (Spatha monophylla 1-flora uno latere fissa, altero translucens)

81. Acis.—Perianthium (sexpartitum?) laciniis alternè paribus; filamenta toro germinis inserta; antheræ convergenter erectæ basi affixæ, poris superne lateralibus; stylus superne attenuatus; stigma parvulum fimbriatum. (Folia filiformia)

82. Erinosma.—Perianthium sexpartitum; laciniæ consimiles; filamenta brevia libera erecta toro germinis inserta; antheræ erectæ basi affixæ poris rotundis terminalibus; stylus crassè clavatus; stigma triangulare acutè attenuatum; pericarpium turbinatum evalve; semina albescentia. (Folia lorato-linearia; spatha monophylla, uno latere superne fissa, altero translucens)

§. 2. Scapus cavus: semina testâ nigrâ.

83. Leucojum.—Scapus marginato-anceps; spatha monophylla, profundè fissa marcescens ;p erianthium sexpartitum, laciniis subæqualibus (apicem versus angustatis) filamenta erecta toro germinis inserta;

antheræ erectæ, basi affixæ poris terminal. et latere dehiscentes; stylus tenuis clavatus; stigma triangulare acutè attenuatum; capsula trigona trilocularis trivalvis.

Subordo 7. TACCÉÆ?—Bulbo et foliis Aroideis. Filamentis superne cucullatis antheras superantibus.

A me ad subspadiceas relatus ob perianthium vix, ni fallor, petaloideum, affinitate non dubiâ ad Orontaceas spectans. *Flores nunquam aspexi.*

Tacca.—Per. regulare, persistens; filamenta basi laciniarum inserta infra dilatata; antheræ cucullæ intùs adnatæ; ovarium 1-loculare placentis 3 parietalibus polyspermum.

Ataccia?—Prezl.

FIRST DIVISION.—BRANCHED.

Suborder 1. XEROPHYTÉÆ.—Schistandrous, *i.e.* anthers opening laterally and completely.

1. XERÓPHYTA.—Perianth tubed, limb regular persistent; filaments inserted at the base of the segments; anthers long, linear, subsessile; stigma oblong, dilated; capsule rough, 3-celled; seeds numerous. (Style and stamens straight?)

A suffruticose plant, with small alternate branches, harshly clothed by the dry imbricating sheaths of the old leaves; leaves rigid, acute, like those of pinus, crowded at the ends of the branches; flowers terminal, generally solitary. Native of Madagascar, only known by Commerson's dry specimen.

2. VELLÓSIA.—Perianth campanulate, scarcely tubed; stamens sometimes 12, 15, 18, or 24, connected in 3 or 6 groups; filaments short; anthers erect; (pollen globular?) style straight tripartible; capsule 3-celled, 3-valved; valves at the top, horizontal or imperfect, (probably meaning a transverse fissure below the opercle as in Hypoxis) seeds square, cuneate, with a single shell.

1. Squamáta.—Pohl Braz. ic. v. i. t. 9. flowers blue.—2. Ramosa. Martius. Braz. t. 6. blue.—3. Aloæfolia. ib. t. 7. blue.—4. Aspérula, ib. t. 8. blue.—5. Plicata, ib. t. 9. white.

This genus is unknown to me, but amply described by Dr. Martius. They are natives of Brazil, having a habit between Barbacenia and Fourcroya, and give a peculiar appearance to the country where they abound, the largest acquiring some resemblance to the form of a Yucca, with less rigid leaves, and flowers which are either white or blue, borne on a single stalk. Vellosia has the same remarkable peculiarity as Gethyllis, producing an occasional superfluity of stamens in groups.

3. Barbacénia—Germen erect, perianth continuous tubed; filaments bifid longer than the anthers; style acuminate longer than the stigma; seeds small, numerous, angular by contact with a bay shell margined with white. Pl. 1. f. 29. (Limb reflex. Inhabit Brazil.)

1. Purpúrea.—Bot. Mag. 54. 2777.—Flowers purple.—2. Tricolor. Mart. Braz. t. 10. orange; branching.—3. Tomentósa. ib. t. 11. orange; branching.—4. Longiflóra. ib. t. 12. yellow.—5. Bícolor. ib. t. 13. yellow, green without; branching.—6. Rubro-vírens. ib. t. 14. f. 1. dull red.—7. E'xscapa. ib. t. 14. f. 2. yellow; scarcely branching.

These plants have great resemblance to Vellosia, though of very inferior stature. I believe that no species but purpurea has been introduced into this country. It was raised by me from seeds concealed in the small quantity of vegetable mould and moss adhering to some epiphytes which had been collected in the neighbourhood of Rio Janeiro, which it is always advisable to save, and spread upon a pot full of earth, for it will generally be found that some seeds are lurking in it, and probably better preserved than if they had been gathered intentionally.

It is immaterial, as far as concerns the Amaryllidaceous plants, whether the branching, the caulescent, and the scapaceous divisions be considered as three separate orders, or as portions of one; but they should not be separated without carefully examining how far a similar limitation would be desirable in other orders, and whether it is not more convenient, for the purpose of giving a clear and easy view of the whole vegetable creation, to reduce the number of orders by converting some of those now defined into suborders, than to multiply them by further dismemberment; I entertain no doubt upon the subject, and I consider that Dr. Lindley's alliance Narcissales should be dropped, and the whole hexandrous hexapetaloid portion of the monocotyledonous plants included under the alliance Liliales, the triandrous under Ixiales. But the determination of this, which is a discretionary point of convenience, should be postponed, till a final and satisfactory arrangement of the entire system shall have been effected, when it should be made with a view to the consistency of the whole.

SECOND DIVISION.—CAULESCENT.

Suborder 1. HYPOXIDÉÆ.—Schistandrous. Operculous, i. e. the base of the style forming a prominent portion of the ovary.

§. 1. HYPOXIDIFORMES.—Sepals and petals conformable; leaves plicate. There is a great disposition to hairiness of the exterior of the germen and flower in this section.

WELDÉNIA? — If truly an epigynous hexapetaloid flower depauperated, or in an imperfect state, which I scarcely believe; it rests on the report of Karwinsky, who has omitted to state whether the germen is superior or inferior. Perhaps it may be allied to Commelina.

Perianth long-tubed; tube erect; limb patent, tripartite; (whether the sepals or the petals are abortive, is not stated) filaments inserted at the mouth of the tube, the alternate shorter; anthers erect, affixed at the base between the cells; style filiform, erect; stigma triangularly capitate.

1. Cándida.—Schult. fil. in Bot. Zeit. 1829. p. 1. t. 1,A

4. CURCULÍGO.—Germen erect, bracteate, nearly subterraneous; tube adhering to the style, cylindrical upwards; limb regular, patent; filaments short, inserted in the mouth of the tube; anthers distant, erect; seeds black, pendant by a thick white chord filling a large indenture between the umbilicus and foramen; umbilicus conspicuously beaked, proceeding from the side. (Leaves broadest near the base?)

1. Orchioídes. Bot. Mag. 27. 1076. Roxb. Cor. 1. 13.—2. Plicáta. Jacq. H. Sch. 1. 88.—*var.* glabra. Bot. Reg. 4. 345. Forbesia plicata. Ecklon topog.

—3. Brevifólia. Dryand. Hort. Kew. ed. 2.—4. Ensifólia. Brown Prod. 290. Australia.—5. Stans. Schultes.—6. Latifólia. Bot. Mag. 46. 2034. Bot. Reg. 9. 754. Flowers villous externally.

The ovules of latifolia are said to be round; if the seeds should prove not to have the extraordinary beaked umbilicus of the genus, it can scarcely be a Curculigo; but it may have been overlooked in the ovules or not yet developed. We have no account of its seed. Gærtner describes the fruit of C. orchioides to have as many cells as there may be seeds, one above another; but such are perhaps rather membranous envelopements. I have not perceived them, nor have I ever found in the capsule an upper seed, as stated by him, without the prominent umbilicus.

5. Molinéria.—Stalk curved at the top, capitulate, many-flowered; germen nodding, bracteate; tube adhering to the style, short; limb regular, patent; filaments short, inserted at the mouth of the tube; anthers fasciculate, erect (said to be monadelphous or united), style straight; stigma dilated; seeds red, wrinkled, round; outer integument brittle; inner brown, crustaceous. *I have taken the name from Colla Hort. Rip. who has applied it to a plant allied to Curculigo, with a character resting on points of no value, except that on inspection of the ovules he found no appendage; meaning, I suppose, no rostrate umbilicus. I may, therefore, assume that his plant was one of the species with round seeds, which can scarcely belong to Curculigo. (Leaves long, petiolated. These plants have the outside of the germen and perianth hairy.)*

1. Recurváta. Bot. Reg. 9. 770.—2. Sumatrána. Lodd. Bot. Cab. 443.—3. Capituláta. Leucojum capitulatum. R. et Schultes. Lour. C. Ch. 246. Leaves wide, petiolated, plicate; petiole a foot long; head of flowers large, roundish; scape short, radical, reflex; spathes, or rather bractes, 1-flowered; segments adhering together at the base, thickened at the point, golden within, brown and villous without; stamens six, short, equal; stigma simple. It seems strange that a plant so described should have been mistaken for a Leucojum.

6. Hypóxis.—Germen erect; perianth deeply divided with

an annular base; expanding in the sun, persistent; filaments short, subulate, inserted in the disk; anthers sagittate, erect, affixed between the cells; style short, three-furrowed, tripartible down to the opercle; stigma short, erect, fimbriated; capsule 3-celled, 3-valved, the valves breaking transversely from the opercle, parting laterally upwards, united below; seeds small, black, the foramen a little pointed, the umbilicus lateral, minutely beaked.

Flowers yellow. American. 1. Erécta.—2. Caroliniénsis. —3. Júncea.—4. Mexicána.—5. Pusílla.—6. Húmilis.—7. Elongáta.—8. Brevíscapa.—9. Decúmbens.—10. Scorzoneræfólia.—11. Grácilis.—*African.* 12. Sobolífera.—13. Villósa.—14. Oblíqua. —15. Obtúsa.—16. Stellípilis. Bot. Reg. 663.—17. Tomentósa.—18. Angustifólia.—19. Gramínea.—20. Serráta.—21. Lineáris.—22. Tabuláris.—23. Júncea. Ecklon.—24. Luzulæfólia.—25. Veratrifólia.—26. Ováta.—*Australian.* 27. Praténsis.—28. Hygrométrica.—29. Margináta.—30. Glabélla. —*Asiatic.* 31. Mínor.—32. Aúrea.—33. Minúta. *Flowers yellow, white, or blue; Cape of Good Hope.* 34. Affínis.—35. Púmila.—36. Álba.—37. Dúbia. —38. Aquática.—39. Stelláta.—40. Tridentáta.—41. Cauléscens.—42. Eláta.

Doubtful Species.

43. Subtrígyna. *Willd.*—44. Scábra. Lodd. Cat.—*Flowers blue.* 45. Geniculáta.—46. Acumináta.—47. Láxa. *Ecklon.—Flowers yellow.* Flavescens, Longifólia, Aúrea, Tenuifólia, Flavipétala, Filifólia. *Ecklon.—Flowers white.* Mínor. Spathacea.—Of Ecklon's species little is known to me besides the names. The species require more careful investigation than they have yet received. It is difficult to believe that stellata with an annual tuberous root should be of the same genus as those with persistent root and leaves. I have never seen the fruit of stellata.

7. CŒLÁNTHUS.—Scape few-flowered, nearly enclosed in a sheathing leaf; germen sessile; limb deeply cut (probably not absolutely six-cleft), campanulate, conniving; filaments inserted at the base of the seg-

ments; anthers versatile.—An obscure genus resting on the report of Schlechtendal, Reliq. Willd.—One only species; native country unknown, perhaps the Cape of Good Hope.

1. Amplificátus.—Herbar. Willd. Bulb of the size of a small nut; scape 3 inches; sheathing leaf lanceolate, acuminate, undulate, plicate, with the point bent downwards; flowers sessile, with long acuminate slender bractes.

§. 2. Lanariæformes (or a suborder Lanarieæ).—Leaves equitant? Flower more or less downy.

8. Anigozánthus.—Perianth downy; tube long, curved; limb more deeply cleft underneath; segments nearly equal, standing apart underneath; filaments dilated at the base, short, bent, inserted at the mouth of the tube; anthers erect, adhering longitudinally; style curved, deciduous; stigma clavate; capsule 3-celled, dehiscent by the opercle; seeds numerous, obovate, black.

1. Rúfa.—Labill. voy. 1. 411—22. Nov. Holl. 2. 119. Stalk downy, anthers not bearded.
2. Flávida.—Red. lil. 176. Bot. Mag. 29. 1151. grandiflora. Par. Lond. 97. Stalk smooth, anthers with a reflex slender point. Natives of Australia.

9. Lanária.—Perianth tubed, persistent; limb regular; filaments inserted at the base of the segments; anthers versatile; capsule 3-celled; cells 2-3-seeded.

1. Plumósa. Willdenow.—Argolasia. Jussieu.—Native of the Cape. Perianth downy without.

Obs.—At this point the epigynous plants make a close approximation to the feathery-stamened Asphodeleæ through Narthecium, which would stand between Lanaria and Lophiola, if its ovary were not absolutely superior.

10. Lophíola.—Perianth deeply cleft, regular, reflex; filaments erectly patent; anthers oblong, recumbent; style tripartible to the opercle; stigma simple; opercle prominent; very little of the germen inferior; capsule ovately pyramidal, 3-celled; seeds many, in two rows.

1. Aurea. Bot. Mag. 39. 1596. Conostylis Americana. Pursh Fl. Am. Sept. 1. 224. Disk downy.

11. **Conóstylis.**—Perianth downy, deeply cleft, regular, semipatent, persistent; filaments short, erect; anthers erect; style conically dilated, hollow, tripartible, persistent; stigma short; capsule dehiscent in the opercle; seeds numerous.

1. Aculeáta. Bot. Mag. 57. 2989.—2. Serruláta. Brown Prod. 300.—3. Setígera, ib.—4. Breviscapa, ib. 301.—The perianth is downy within in the two last species.

12. **Phlebocárya.**—Perianth deeply cleft, persistent; filaments inserted at the base of the segments; anthers quadrangular, subsessile; style filiform; stigma simple; ovary 1-celled by defect; 3-seeded; capsule 1-seeded.

1. Ciliáta. Brown. Prod. 301. Native of Australia.

13. **Campynéma.**—Perianth regular, deeply cleft, persistent, alternate segments equal; filaments recurved; anthers versatile; styles distinct, subulate, recurved; capsule 3-celled, tripartible, dehiscent inwardly at the points; seeds numerous, flat, with a spongy shell.

1. Lineáris. Labill. Nov. Holl. 1. 93. t. 121. Root fasciculate, stalk a foot or more, leaves linear gramineous smooth, those on the stem half embracing it; flowers 1-4, terminal; stigmas simple (unless the stigmas are long and mistaken for styles). Cape Van Dieman. Seeds glossy rufous.

§. 3. **Alstrœmeriæformes** (or a suborder Alstrœmerieæ). Sepals differing in form from the petals. Petaline filaments exceeding. (In this section there is a disposition to hairiness of the filaments, almost obsolete.)

14. **Chœradódia.**—Root fibrous; leaves both radical, and borne on the stalk; stalk erect; umbel many-flowered; sepals and petals very unequal; style strumous; capsule triangular.—This genus is not sufficiently known; if it should prove not to be operculous, it would stand next before Fourcroya.

1. Chiléensis.—Strumaria Chilensis - Molina, Saggio s. Chil. Sepals and petals very unequal, the one white, the other white tipped with red. Stalk erect, 5 or 6 feet high, bearing 3 or 4 small alternate leaves,

which embrace it; radical leaves many, 2 feet long, smooth, acute, of a fine green. Flowers said to resemble Albuca. Called in Chili Thekel. A cold infusion of its leaves is purgative and diuretic.

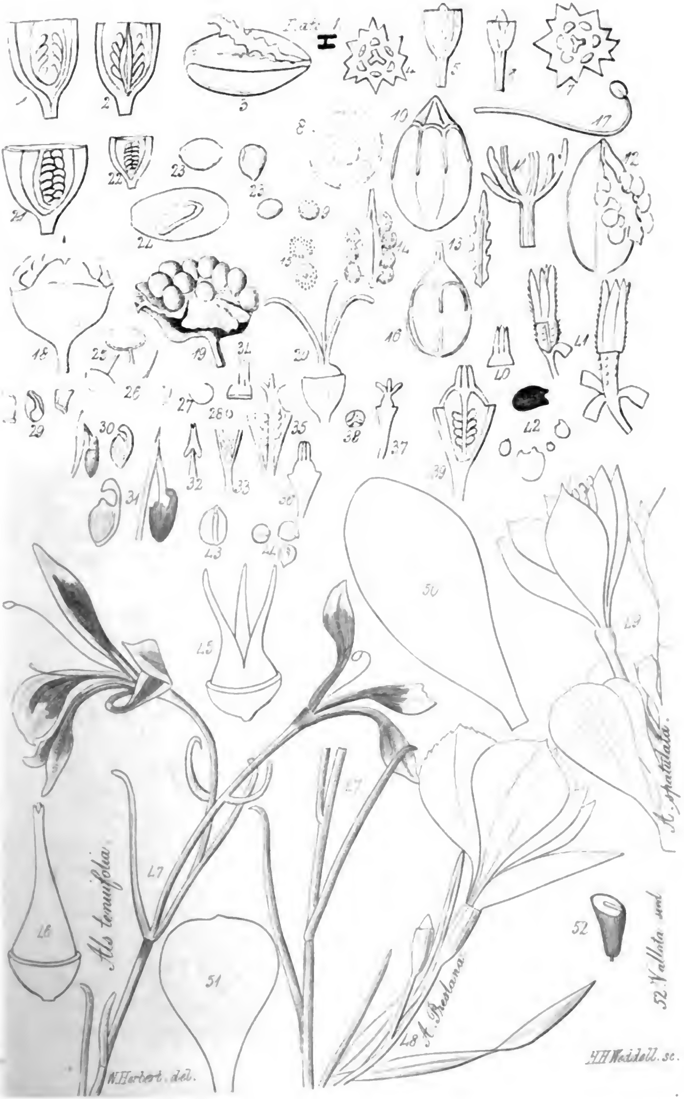
15. **Alstrœméria**. — Germen six-ribbed, above 6- or 12-angled, with a 3-lobed point; ovules suberect; perianth with fourfold disparity divided to the base; petals 2 upper erect, the lowest stretched forward; filaments successively curved upwards, inserted in deciduous glands on the germen, scarcely adhering at the back to the segments, ultimately distinct; the petaline glands marking the disk with an acute oval scar, the sepaline with a scar exceeding a semicircle in breadth; anthers attached at their base; style ultimately recurved; capsule roundish, more or less oblong, acutely operculate, 6-ribbed, with crustaceous valves bearing the dissepiments, springing asunder by the axis splitting from the base into three parts, the lower half of the ribs remaining inseparable from the peduncle; seeds roundish, with a tubercled shell not easily separated; hilum smooth; chalaza circular; inner coat inseparable from the horny albumen.

Occidental plants; as far as I know with an erect stalk, leafy or scaly, peduncles one or more flowered, usually bracteate.

1. Peduncles 1-flowered; flowers a little incurved, tube-formed, narrow; upper sepal longer. *Brazilian plants.*

    1. Psittacína.—Bot. Mag. 57. 3033. Bot. Reg. 18. 1540. Sweet Brit. fl. g. 2. 15. Barren stem subrosulaceous. Flowers red, tipped with green spotted.

    2. Isabellána.—Spec. M. Isabelle. Herb. Hooker. Coptis 19. S. Brazil. From the province of Rio Grande do Sul. Stem a foot; leaves remote (four), sessile, suberect, lance-linear, less upwards on the stalk, rather stiff; involucral bractes very small; peduncles 11, simple, 1½ inch long; perianth incurved, tube-formed, 1½ inch long (yellow tipped with green ?); sepals wider, subspatulate, subacute; petals narrowly spatulate, acuminate; bar-

Tab. 1
Als tenuifolia
A. spatulata
48 A. Presliana
52. Vallota seed
W. Herbert. del.
H.H. Waddell. sc.

ren stalk not known. It seems to be allied to Monticola. Pl. 6. f. 4—6.

3 ? Montícola.—Martius ap. Schultes. Stalk 2 feet, smooth; leaves lance-linear, remote; sessile, glaucous underneath; peduncles 6, simple; sepals (red ?); spatulate with a point obsoletely crenulate; petals lanceolate acute, the upper a little longer with purple lines, 19 or 20 lines long. Barren stem not known. Found on Serra dos Lagos, in the province of Bahia.

4 ? Plantagínea.—Martius ap. Schultes. Leaves narrow, lanceolate, smooth, erect, resupinate (lance-ovate on the rosulaceous barren stem); involucral bractes many, longer than the peduncles; sepals obovate, spatulate, obtuse; petals obovate, oblong, apiculate; colour uncertain; appeared not to be spotted. On high hills of Minas Geraes.

2. *Peduncles one-flowered; upper petals erect; lower one abbreviated. Chiefly Brazilian plants.*

5. Caryophyllǽa.—Jacquin. H. Sch. 4. 465. A. ligtu. Bot. Mag. 4. 125. Barren stalk rosulaceous; fertile scaled; involucral bractes leaf-like; upper petals spatulate, with a long slender point, white, sometimes lined and speckled with red and the point red; lowest petal almost obsolete; sepals crimson upwards, tipped with white, the upper much longest. *Brazil.* This plant is generally known to cultivators by the erroneous name of ligtu, given through great inattention by Mr. Curtis, for it has no affinity to the ligtu of Feuillet, which he states to be a Chilian plant. In R. and Sch. the name Curtisiana is substituted; but I can see no reason for that, since the error had been long ago set right by Jacquin, who named it Caryophyllæa on account of its fine fragrance, and there can be no doubt at all as to the identity of the plants. It is easily cultivated in the stove, requiring absolute drought in the autumn and early winter, and will send up flower stems as soon as it is started in the very early spring, if placed on a hot flue and abundantly watered. When it has done flowering, it may be removed into a cooler situation. Its

time of flowering will depend upon the time of ceasing and recommencing to water it. The barren stalks follow the flower stems. It varies in our stoves with brighter coloured flowers, and is probably capable of much improvement from seed.

Var. 2. Catharinénsis.—Pl. 2. fig. 6. Mrs. Graham, Rio; and also Tweedie, St. Catharine's, Brazil, Herb. Hooker. Involucral bractes very slender; petals spotted upwards.

6. Macraeána.—Spec. Valparaiso. Macrae. Feb. 1825, Herb. Lindl. Leaves crowded at the base, suberect, lance-oval, 3 inches long, besides the petiole 1¼, smaller upwards on the stalk; involucral bractes three, narrow, 1½ inch long; peduncles erect, above an inch long; flowers suberect, lowest petal abbreviated, upper longest and narrow; lateral sepals broadest. This Chilian plant has very much the foliage of Caryophyllæa, but bears its flowers on the leafly stalk; it has a like abbreviation of the lower petal, but appears to differ much in the form of the segments. It will prove a greenhouse or hardy plant, whenever it may be introduced.

7. Inodóra.—Pl. 2. fig. 1. Tweedie Herb. Hooker. In crevices of rocks near Solta, S. Brazil. Stalk slender, leaves about half an inch apart, oval, 1½ inch long besides the petiole ¾; involucral bractes leaf-like with short petioles; peduncle ⅝, upper petals narrow, spatulate, with an acute point, spotted, 1⅛ long, lowest about ¾; sepals more obtuse. (Colour seemingly red, yellow, and green?) Mr. Tweedie writes, that on its first shooting, this plant has much the appearance of Caryophyllæa, but as it advances, becomes very different; that its tubers are less palmate, and its flowers scentless.

8. Longistamínea. — Martius ap. Schultes. Stalk smooth, 20 inches high, scaled below; leaves lance-linear, acute, resupinate; involucral bractes obsolete; peduncles 5; sepals oblique ovate, petals less oblong, lanceolate, with a slender point, the lowest least (colour roseate? not spotted).

3. *Peduncles* 1 *and* 1-2-*flowered; leaves short, linear; perianth small, reflex.*

9. Linifólia.—Humb. Kunth 3. 282. Stalks not a foot high, purple, densely leaved, scaled below; leaves scattered, rather obtuse and coriaceous, 5-nerved, 8-9 lines long; petioles short, thick, hairy; sepals nearly equal, red; outside downy; petals slenderer, just longer, yellow spotted with red, the lowest petal protruded; segments reflex; style downy. On the cold parts of the Paramo de Almaguer, between the river Marmato and the confines of Puntaurcu.

10. Revolúta.—Pl. 7. fig. 9. Flor. Peruv. ubsque icone. Poeppig fragm. syn. p. 7. Stalk erect, 12-13 inches, scaled below in the specimen; leaves scattered, erect, linear, scarce an inch long; perianth purple, reflex; petals less than the sepals, the two upper yellow, spotted with purple below the middle; peduncles 1-2 flowered? Poeppig says leaves glaucous, peduncles 6-9, 2-flowered, leaves very fleshy, colour of the flower varying between rose-coloured and purple; segments reflex, not revolute. In stony Alpine fields by the torrent Rucue in S. Chili, flowering in December.

4. *Peduncles* 1-3-*flowered; leaves resupinate.*

a. leaves downy.

11. Foliósa.—Martius ap. Schultes. Stalk 1-2 feet; leaves lance-linear, underneath glaucous with thick down; peduncles 5-9, 1-2 flowered, sepals spatulate, scarlet with a white tip; petals red-lead colour, with a scarlet tip and purple lines.

Var. 2. Leaves narrower. Var. 3. Stalk shorter, leaves crowded on the middle of the stalk.

b. leaves smooth: barren stalk not rosulaceous.

12. Peregrína.—Pelegrina. Feuillet Obs. Bot. Mag. 4. 139. Peduncles 1-flowered. Too well known to need particular description here. Its leaves are resupinate and very fleshy; its flower remarkable by the high shoulders of its sepals, which are obliquely cross-nerved. This plant will live out of doors against the front of a green-house, having some saw-dust heaped upon it in winter. It requires an airy situation, if sheltered under glass.

Var. 2. Peduncles 2-3-flowered. There is much sporting in the different specimens, not worth particularizing.

Var. 3. Albescens.—Pl. 3. fig. 4. Cumming 568. Valparaiso. Herb. Hooker. Peduncles 1-flowered; the shoulders of the sepals white, the middle green; the petals marked with purple: stalk robust, 15-16 inches.

Var. 4. Squammata.—A. M. 317. Valparaiso, Sept. Steep cliffs near the sea. Herb. Hooker. Sharp scales instead of leaves.

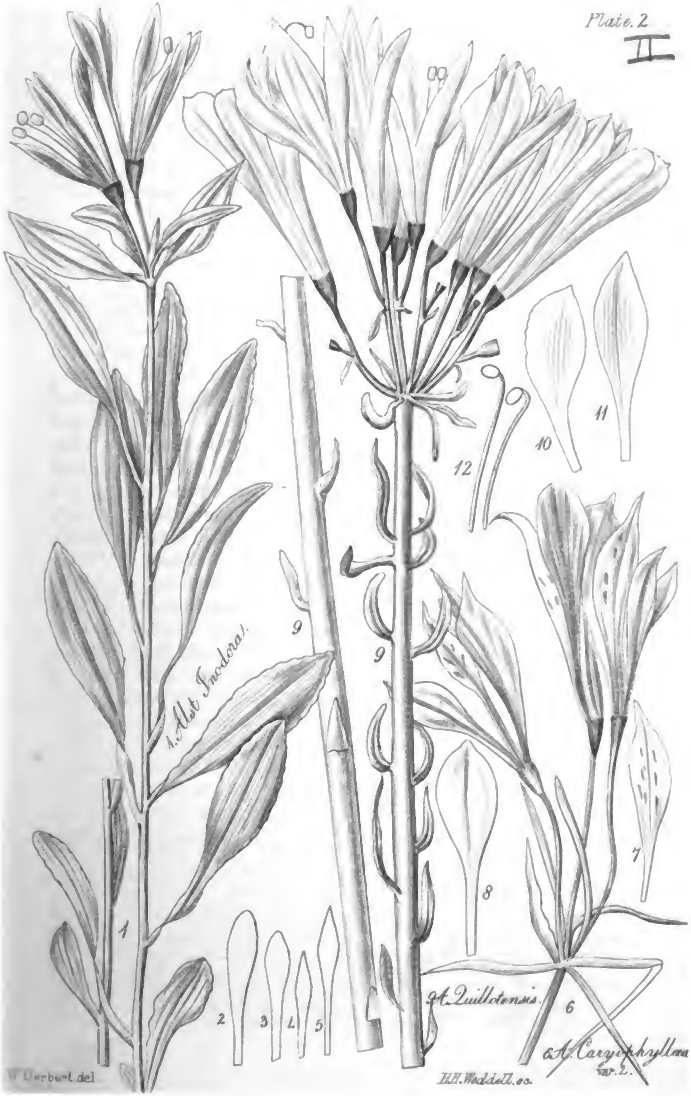
Var. 5. Flore albo; *hortensis*. A beautiful white and green variety raised from seed in England: white and red seedlings are both raised from its seed: the white variety is tenderer than the red.

13. Lígtu.—Feuillet. Obs. 710. Described and figured by Feuillet, who brought the first plant of this genus before the public, and stated by him to grow near Conception in Chili. The name was by a great and unaccountable error in the Bot. Mag. applied to a tropical plant, in no manner resembling it, which has been generally cultivated under a wrong name, being properly A. Caryophyllæa of Jacquin. Feuillet's plant has the leaves 2-3 inches long, 5-16ths wide, nearly sessile, peduncles bracteate 3-flowered, flowers large, of a fine purplish red, streaked longitudinally on the two upper petals with white; sepals not auriculate or shouldered like those of peregrina. Jacquin says that he had once in cultivation a plant which nearly answered the description. It appears by the specimens under Ruiz's name lineatiflora, to admit variations of the same nature and extent as those which occur in peregrina; leaves broad and narrow; peduncles one or more flowered; but it is readily distinguished from that plant by the different form of the sepals.

Var. 2. lineatiflóra.—Flor. Peruv. 3. 60. 289. Peduncles 2-3-flowered; leaves ovate acute, 1 inch and $\frac{3}{4}$ wide; the purple of the flowers deep. Ruiz's specimen, Herb. Lambert. has very broad acute leaves and bractes, and the sepals not auriculate. I find a one-flowered variety in Dr. Lindley's Herbarium, with leaves little broader than those of pere-

Plate. 2

II



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grina, and varieties with 2-flowered peduncles, both broad and narrow leaved.

Var. 3. Cumming 568, near Valparaiso. Herb. Lindl. Leaves broad; peduncles 1-flowered, short, thick.

Var. 4. Macrae. Conception. Herb. Lindl. Leaves narrow; peduncles 1-flowered, short.

14. Púlchra.—Bot. Mag. 50. 2421. Tricolor. Hook. Ex. fl. 63. Flos martini. Bot. Reg. 9. 731. Leaves subglaucous, acute, resupinate; peduncles 2-3 flowered; perianth white, tipped with red and green; upper petals blotched and streaked with purple, having a bright transverse band of yellow. Petals spatulate, shortly acuminate; style and filaments white; anthers yellow; pollen straw-coloured. Near Valparaiso; Cumming. In shady places on the gravelly hills near Concon in N. Chili; flowering in October; Poeppig. Fragm. Syn. [Peduncles erect, often 9 inches long, five to the fork.]

Var. hort. Bícolor. Loddiges Bot. Cab. 1497. Perianth white with green tips; upper petals broader and shorter than in the former (from the seed of which it was raised) with a deep yellow blotch streaked with green. Another two-coloured seedling, without any purple, was raised by Mr. Loddiges from the seed of bicolor, which had the upper petals intermediate in length and breadth between those of bicolor and the original pulchra. The parent of bicolor stood near the white variety of peregrina, but there seem no features in it that could justify a belief that it was obtained by a cross with that plant. It has the foliage and habits of pulchra, and seems to be merely a beautiful seminal variety. It is very fertile.

A. pulchra is very distinct from peregrina in root and habit, as well as in flower and foliage. Its tubers endure a very long period of rest, and bear our winters in a dry situation without any covering, but it is very difficult to preserve the young shoots from the bite of slugs in the spring on their fisrt appearance. Its leaves are very thin, those of peregrina fleshy and shining; its sepals are not auriculate. Its root is disposed to run like couch-grass, and it bears tubers on the lower part of the stalk, which is not the case with peregrina. The name pulchra has the priority over tricolor and flos martini. The substitution of the latter name cannot be admitted; the Chilian name, flower of St. Martin, does not even seem to be confined to this species.

5. *Peduncles 1-flowered; leaves spatulate, not resupinate.*

15. Spathuláta.—Pl. 1. f. 49. Presl. Rel. Hank. 2. 122. Specim. Andes of Chili and Mendoza, with three flowers. Gillies. Herb. Hooker. The leaves of the specimen are spatulate with a small point, 1$\frac{3}{8}$ of an inch long, not resupinate, $\frac{1}{2}$ an inch wide; peduncles $\frac{3}{4}$; perianth 1$\frac{1}{8}$; sepals not auriculate. Colour pale? or red evanescent in the specimen? not spotted.

Var. 2. Bridgesiána.—Pl. 1. f. 50. Specim. Los ojos de agua. Bridges, 38. Herb. Hooker. Only the barren stems. Leaves above two inches long, $\frac{3}{4}$ to $\frac{7}{8}$ wide, rather less obtuse than the latter.

Var. 3. Curbrána.—Pl. 1. f. 51. Specim. ex Curbran. Herb. Hooker. Stalk short and more rosulaceous; leaves 1$\frac{1}{8}$ long, $\frac{7}{8}$ wide, very obtuse.

6. *Peduncles 1-2-flowered; leaves subspatulate; not resupinate.*

16. Neilliána.—Neillii. Bot. Mag. 58. 3105. Specim. Herb. Hooker. Leaves rather more spatulate than those of peregrina, and not resupinate. The flowers blush pink, the petals marked with deeper colour, and the two upper with a yellow blotch. I am informed by Dr. Neill, after whom it was named, that it is a very shy plant, and has yielded no seed or increase from the root, since it has been in his possession.

7. *Leaves narrow, not resupinate.*

A. Peduncles 1-flowered.

17. Tenuifólia.—Pl. 1. f. 47. Gouan, No. 1. Herb. Hooker. Stalk not a foot high; leaves very slender, 1$\frac{1}{2}$ inch long; peduncles two, 2 inches long, bracteate near the middle; perianth above 1$\frac{1}{4}$ long, (intensely red? with paler tips?) segments acuminate, very slender at the base. The bractes on the peduncles perhaps indicate that this plant has sometimes 2-flowered peduncles.

18. Versícolor. — Flor. Peruv. 3. 59. absque icone. Stalk six inches, 2-3-flowered; leaves lance-linear, sessile; perianth yellow with purple marks; sepals nearly equal; petals narrower, the lowest widest.

19. Pállida.—Bot. Mag. 58. 3040. Specim. Herb. Hooker. Leaves sessile, above two inches long, narrow; sepals broad, rounded, with a small point; perianth denticulate, pale rose-colour; two upper petals yellow in the middle and marked with red, lower down with orange.

B. Peduncles 2-3-flowered.

20. Presláana.—Pl. 1. f. 43. Albiflora. Presl. Rel. Hank. 2. 121. Poeppig Frag. syn. Leaves above two inches long, 3-16ths wide, acute; peduncles four, 2-flowered; perianth denticulate, deep rose-colour, with thick brown tips; upper petals pale yellow, marked with purple. Poeppig states that the colour is so evanescent that it appears to be white in the dry specimen by which Presl was misled to give the plant an erroneous name. The rosy colour seems to fade in most of the dry specimens of this genus. The name albiflora cannot be preserved without absurdity. This plant seems chiefly separable from pallida by its 2-3-flowered peduncles, and is perhaps to be considered as a variety thereof. It grows in S. Chili in rich meadows near Antuco.

21. Hookeriána. Schultes, Syst.—A. rosea. Hook. Ex. fl. 181. non Ruiz. A very hardy plant, preserving its foliage throughout the winter out of doors against the front of a stove, and never going to rest; flowering in succession through the whole summer, and ripening its seed. Its germen is strongly marked with purple and very round. See Pl. 1. f. 1, 2, 4, 5, and 17.

Stalk 5-12 inches high; leaves glaucous, sessile, a little tortuous, not resupinate, 3 inches long or less, $\frac{5}{32}$ wide; peduncles erect, bracteate and forked near the base, 2-4-flowered; secondary peduncles erect, contiguous; sepals obovate apiculate; petals obovate acuminate; the lower portion of the upper petals whitish and line-speckled, a faint yellow mark above the speckles; the rest of the perianth pale rosy; points greenish; perianth about 1½ inch long or less; capsule round, purple-ribbed; point much shorter than in Pulchra.

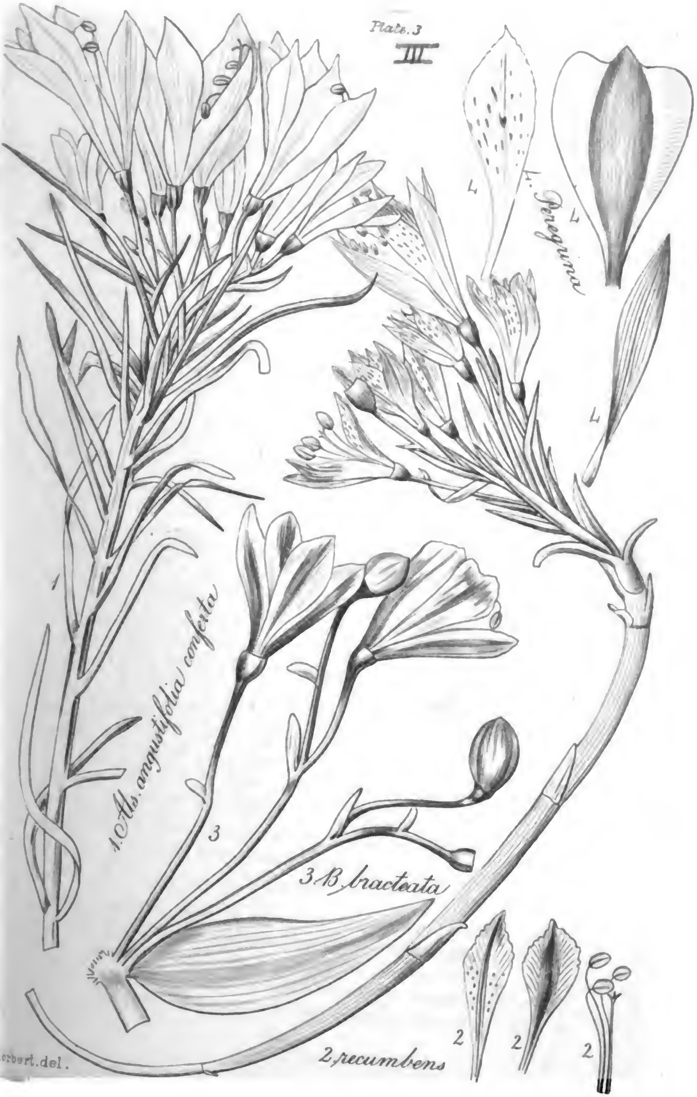
22. Cummingiána.—Raised from Chilian seed collected by Mr. Cumming. I am by no means clear that it should not be considered a variety of Angustifolia.—Specim. Versicolor Valparaiso, Bridges, 35. and specim. "Common on mountains near Valparaiso, Nov. and Dec." Herb. Hooker. seem to be this plant.

Stalk 12-15 inches high; leaves subglaucous, sessile, tortuous, not resupinate, 4 inches long or more, 3-16ths wide; peduncles 3-5, diverging, bracteate and forked 2-2½ inches above the base, 3-6-flowered; secondary peduncles diverging; segments acuminate, a little tortuous, petals line-speckled their whole length; the inferior part of the two upper petals yellowish, the rest of the perianth pale brownish or yellowish red (very variable in different seedlings), perianth 1¾ inch long; sepals ⅜ wide, obovate; upper petals 5-16ths wide, below marked at the point with green, the whole below the green dashed with short red streaks; the other four segments with a green blotch at the point extending down the rib on the outside; lowest petal acuminate; pollen pale dull purple; style and stigma pale. Sterile stems weak, with linear glaucous leaves. The colour, and the acuteness of the petals varies in different individuals. I have seen three out of five peduncles on one stalk six-flowered. This plant is impatient of confined air, and thrives well out of doors with a little protection. A. Angustifolia v. Selloensis seems to come near this plant in general appearance.

23. Angustifólia.—Leaves long, linear, sessile, acute; perianth a little more than an inch long, colour evanescent, probably purplish rose; peduncles 3-flowered.

Plate. 3

III



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Var. 1. Conférta.—Pl. 3. f. 1. Specim. Cumming, 354. Herb. Lindl. Leaves crowded, $1\frac{1}{2}$-$2\frac{1}{2}$ inches long; peduncles an inch long.

Var. 2. Intermédia.—Cumming, Herb. Lamb. Cumming, 354. Herb. Hook. Leaves 4-5 inches long, $\frac{1}{8}$ wide; peduncles $2\frac{1}{4}$ long.

Var. 3. Solliána.—Pl. 4. f. 2. Solly. Chili. Herb. Lindl. Leaves 4 inches long; peduncles $2\frac{1}{2}$ long, diverging.

Var. 4. Acumináta.—Pl. 4. f. 3. Specim. Chili. Bridges, marked "Versicolor Martius." Herb. Hook. Leaves 5-7 inches long, not $\frac{1}{8}$ wide; peduncles two inches, robust; perianth acuminate, purplish rose colour; upper petals streaked.

The colour of these four plants is evanescent in the dry specimens, except that in var. 4. it can be seen to have been purplish rose, and the upper petals streaked. It is a vigorous plant, not at all agreeing with versicolor of Ruiz. Var. 1. and 3. appear so different, that if they had not been approached to each other by the specimens of intermedia, which come nearest to Solliana, but are numbered by the collector as if identical with Conferta, I should have supposed them very distinct.

24. Recúmbens.- Pl. 3. f. ~~1.~~ 2 Specim. Cumming, 384. Herb. Lindl.- Lambert—Hooker. Sterile, stem wanting. Fertile stem recumbent, curved, scaled below, the scales acute, becoming more crowded and leaf-like upwards; umbel 10 or more flowered, very crowded; involucral bractes crowded, leaf-like, shorter than the peduncles; perianth near $1\frac{1}{2}$ inch long, acuminate, bright purple; upper petals crossed with bright yellow streaked with purple.—Some of the specimens of this plant are considerably larger than that which I have sketched, and preserve a brilliant colouring of purple and yellow.

§. 8. *Peduncles 2-5-flowered. Stalks tall. (Perianth usually vermilion or golden.)*

A. Leaves smooth.

26. Quilloténsis.—Pl. 2. f. 2. Specim. near Quillote. Bridges, 36. Herb. Hooker.—Herb. Lindl.—Fertile stem above a foot high, scaly below; scales becoming longer, more linear and leaf-like upwards, slender, not an inch long; peduncles about ten, an

inch long, 2-flowered, bracteate; flowers 1½ or near 1¾ of an inch long, slender, golden.

Var. 2. Foliolósa.—Specim. Buenos Ayres; ex hort. Tweedie. Herb. Hooker, with a more leafy stalk.

26. Aúrea.—Bot. Mag. 61. 3350. Aurantiaca. Sweet. Br. fl. g. Stalk 2-4 feet high, leaves glabrous, resupinate, 4½ inches long or less, ¾ wide (persistent after the ripening of the seed till the approach of winter;) peduncles about five, 2-3-flowered, about four inches long, with leaf-like bractes; perianth orange, two upper sepals lanceolate, streaked with red; capsule oblong with a blunt point; seed round pale chesnut colour. Native of the island of Chiloe, and raised by seed imported from thence by Mr. Lowe, Nurseryman, at Clapton. Specimens gathered by Cumming (No. 562), on the banks of the river of Valdivia are less robust, but decidedly identical. This beautiful plant is very hardy, and thrives under a south wall, where it forms a great tuft, and flowers and ripens seed abundantly. Pl. 1. f. 3, 6, 7, 8, 9, 10, 11, 12, 13, and 14.

Var. 2. Valparadisíaca.—Specim. Cumming, 293. Valparaiso. Herb. Hooker. Herb. Lindl. Leaves an inch wide, peduncles nine, 3-flowered; perianth larger and more brilliantly coloured. This plant has been raised from seed from Valparaiso by Mrs. Bridgman of C. Weston near Thetford, but has not yet flowered. By the dry specimens it appears to be the most splendid plant of the genus.

A young plant of Aúrea, planted out in front of a greenhouse two years ago, has now about 50 flower-stems which are four feet high, more or less, each with from three to eight diverging peduncles, two or three-flowered, usually three-flowered, but in no instance more; the peduncles are from 4 to 4½ inches high, forked at 2 or 2½ inches from their base. This splendid species ripens its seed abundantly, and increases so fast by the root, and is so hardy, that I believe it will soon become the ornament of our cottage gardens. By planting it in a shady and cool situation a later succession of bloom will be obtained. Its principal enemies are slugs, which must be destroyed when the shoots first appear, and the caterpillars of the lambda moth in July and August, which devour both the leaf and flower. It conceals itself underground in the day-time, but may be easily killed at night when it feeds. When the black aphis attacks the beans, it molests this plant.

B. Leaves ciliated.

27. Hæmántha.—Flor. Peruv. 3. 60. Province of Rere in Chili. A variable species, distinguished from Aurea by ciliated leaves of a more glaucous colour, a more acutely pointed capsule, and, as far as I have seen, by darker coloured seeds, not regularly round, but deformed with a shorter and conspicuously white hilum.

Var. 1. Simsiána—Pl. 1. f. 15. 16. A. pulchella. Bot. Mag. 49. 2353. Bot. Reg. 12. 1008. Hook. ex. fl. 64. Sweet Br. fl. g. 267. Upper sepal and lower petal much abbreviated; upper petals very narrow, much elongated, acute, yellow (except at the point), with red streaks; sepals wider; general colour brilliant red; peduncles erect, forked 5½ or 6½ inches from the base, 4-5-flowered; secondary peduncles short. There appear to me to be two varieties cultivated in this country besides pilosa, one with longer flowers than the other. That which I possess growing out of doors, in front of the greenhouse, has the stem not exceeding 13 inches, the peduncles 5-flowered, 8 or 9 inches long, much more erect than those of aurea, the bractes smaller. Sweet refers the name Hæmantha of Ruiz specially to the var. pilosa, excluding Simsiana, in which he was mistaken, because Ruiz describes a white variety, and Poeppig found Simsiana to vary with white flowers, but not the smaller flowered plant, which has the leaves more strongly ciliated.

Var. 2. Álbida.—Perianth white with red lines on the upper petals. Mentioned by Ruiz, Flor. Peruv. Poeppig states (Frag. syn. p. 6.) this beautiful plant to be so variable, that he has found specimens growing together promiscuously, in the fields and meadows near Antuco, in South Chili, in December, vermilion, red-lead, orange, yellow, lemon-colour, and white, but always with the dark-red marks on the upper petals. He adds, that in his herbarium he finds one with smooth leaves, which is probably aurea. I have found no approximation in the foliage of seedling plants of aurea and Simsiana, of which the parent plants were growing at a small distance from each other. The flower-stem of Hæmantha perishes almost before the seed is ripe, and the plant goes to rest for about six months; aurea preserves its leaves till cut by severe frost, and is not much disposed to rest entirely.

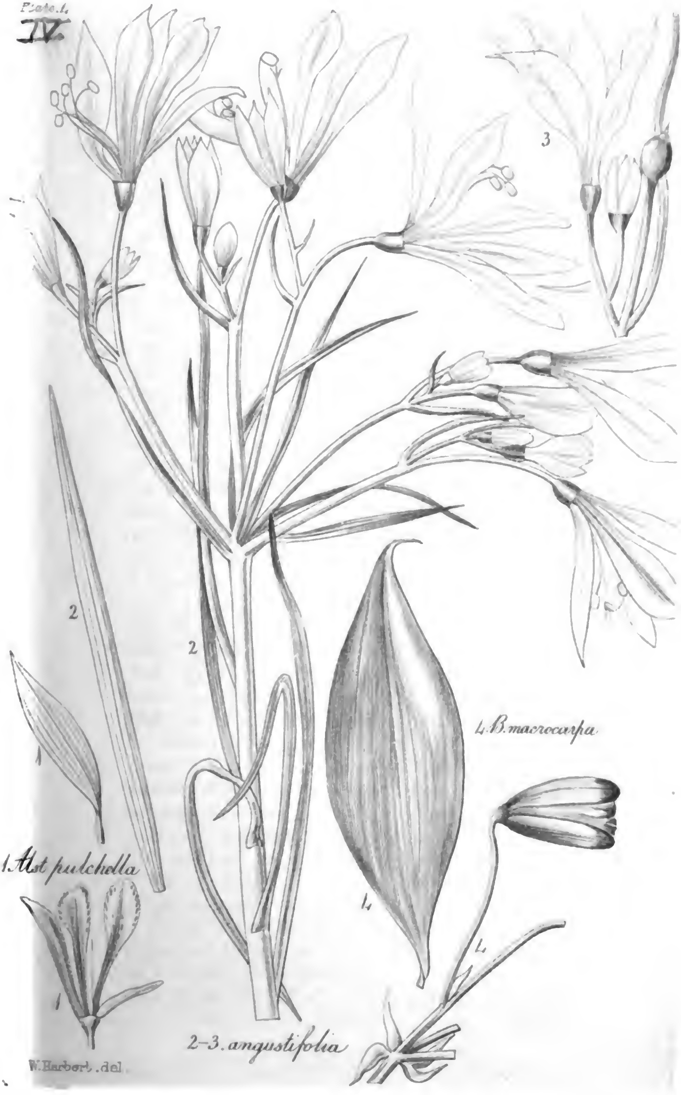
Var. 3. Pilósa.—Bot. Reg. 17. 1410. Ciliaris? Poeppig Fr. syn. A shorter plant? with the ciliation of the leaves more conspicuous, and the sepals serrate instead of denticulate. The colour is much too pale in the plate in the Bot. Reg. which would have prevented Poeppig from recognizing it in his Ciliaris, which I believe to be the same plant, and in that case, whether it be considered as a variety or a separate species, the name pilosa has the priority.—— Ciliaris? Poeppig Fr. syn. absque icone. Stalk 2-3 feet; leaves lance-oval, about 4 inches long, half an inch wide, ciliated with bristles, petiole 1½ inch; upper leaves narrower; peduncles 9-12, 2-flowered, 3 inches long; flowers less than in hæmantha, always vermilion. A very rare plant; on the mountains near Concon in North Chili, flowering in Oct. It seems to differ chiefly in a harsher ciliation, and smaller flowers, which scarcely distinguish it from a species said to be so variable. The longest petals of pilosa, which I believe to be this plant, are 1 inch ¾ long, those of the longest var. of Simsiana, 2 inches and ¼; the shorter comes nearer to pilosa.

§ 9. *Stalk scarcely above ground, one-flowered.*

28. Pigmæa.—Pl. 8. fig. 4—13. Specim. Matthews, 865. near Pasco, Peru. Dec. Herb. Hooker. Root tuberous, white, palmated; leaves just above ground, lance-linear, about an inch long, glaucous; one-flowered, perianth bright yellow; petals marked below with dark brown; stigma deeply 3-cleft. This curious little plant is very unlike an Alstrœmeria in many respects. In the specimen the germen is covered by the leaves, and the segments

Plate. 4.

IV.



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appear very similar in form and regular; but Matthews has transmitted some outlines, by which the germen and ovules appear to conform exactly with Alstrœmeria, the sepals to be spatulate, and the petals lance-oval. He represents the style and filaments straight, which would not agree with Alstrœmeria, but the specimen has a curved style. Fig. 7 to 13 are Matthews's outlines, which are evidently too large. Fig. 4-6 are from the dry specimen.

Doubtful Species.

29. Pulchélla.—Pl. 4. fig. 1. Spec. Herb. Banks. ab arm. J. Banks in Braziliâ lect. This specimen is unfortunately very much mutilated, especially as to the flowers. It is labelled in the hand-writing of Dryander, and was certainly supposed to be the plant intended by Linnæus, Suppl. 206. Linnæus described his pulchella not from a specimen, but from a drawing, and no reliance can be placed upon such a foundation. The specimen in the Banks. herb. has the lower part of the stalk naked or only scaled, the leaves smooth, petiolated, petiole $\frac{3}{4}$, leaf $1\frac{1}{4}$, in all about 2 inches long, lance-oval, acute, 7-24ths of an inch wide in the middle, equally attenuated; peduncles 1-flowered, 1-2 inches, perianth about $1\frac{1}{8}$; the sepals seem lance-ovate, red with yellow, upper petals seem obtuse, spatulate, pencilled with red, green upwards. No such plant appears to have been met with by any later collector, and there is no memorandum as to the part of Brazil in which it was found. It is certainly distinct from all the plants I have described, unless it be a variety of Psittacina, which I do not believe. It is strange that Dr. Sims should not only have confounded Hæmantha with the pulchella of Linnæus, but assumed as nearly certain that it was also the Ligtu of Feuillet, the one being vermilion, the other purple striped with white.

Brasiliénsis (Sello) is much too insufficiently described to be ever identified. It is supposed to be a variety of Monticola.

I have thus to the best of my ability arranged the various Alstrœmerias of which we have any knowledge. That knowledge is in many respects imperfect, and the variability of the species renders their arrangement very difficult. It is possible that the whole seventh section may upon more intimate acquaintance be considered as local varieties of angustifolia, a point of little importance, as they are placed together under one head, and would retain the same names as subordinate, if that were the case. I do not, however, believe that it will be so found, for neither did the many seedlings which were raised of Cummingiana, nor the garden seedlings of Hookeri, vary in the aspect of the stalk and foliage. Being chiefly natives of Alpine situations, these beautiful plants require free air, and (with the exception of Caryophyllæa amongst those we possess) very little protection, except from severe frost. A. Hookeri planted in front of one of my stoves formed a large patch, the foliage resisting all frost in that situation, and flowered throughout the summer; but the two last dry summers have greatly reduced it. They are very thirsty plants in the season of their growth, and should be abundantly watered in dry weather at that time. I apprehend that the singular circumstance mentioned by Poepipg, of his finding A. hæmantha growing promiscuously of every shade of vermilion, orange, yellow, sulphur, and white, arose from the vicinity of the two plants mentioned by Ruiz, the vermilion and the white variety having bred together, and their intermediate produce again with either parent. I do not believe that we shall be able to produce the same result even by garden cultivation and sowing the seed of the vermilion plant, without first obtaining a white variety to cross with the vermilion. The known variability of the genus, however, the white peregrina and the beautiful two-coloured variety of pulchra which have been raised in England, afford a great encouragement to cultivators. It is very remarkable that the stigma of Alstrœmeria does not come to perfection till after the decay of its anthers. The stamens advance successively like those of Nerine undulata, and like them nod before they rise, the petaline filaments taking the lead, but the two upper not simultaneously with the lower. It results from this that the stigma must either be fertilized by the pollen of another flower, or that its own scattered pollen must be efficient after it seems to be dried up and lost; in either case there is a greater probability of the intrusion of the pollen of another individual, than when the stigma and anthers are mature at the same time.

The variation in the form and colour of the flower of A. pulchra, and the two coloured varieties, as well as of the seedlings of A. Cummingiana from imported seed, should render botanists very cautious not to multiply species freely on the appearance of such diversities in natural specimens from different localities, and makes it very difficult to fix on the true distinguishing features. Little attention is to be paid to the length of the style in Alstrœmeria; its maturity is very tardy; it is very short at first, grows out slowly, and at last the stigma, which had appeared to be simple, expands and becomes trifid and patent. The anthers discharge their pollen long before the maturity of the style. The late developement of the stigma should make the genus very liable to spontaneous intermixtures of the species, but render it difficult to obtain artificial crosses. I failed in getting seed at all from an attempt to fertilize the red peregrina by the white, which must have arisen from having neglected the proper moment for fertilizing the style or for selecting the pollen.

A. Psittacina, as well as hæmantha and aurantiaca, flowers well in the open ground, if covered with straw or a thick coat of leaves in the winter. The soil should be light, and the tubers set pretty deep; and any heading that would throw the wet off in the winter will be found advantageous. It is absolutely necessary to pick the slugs off the border, which will otherwise devour every shoot at its first appearance above ground: and it will be found advantageous to cover the bed in the spring with dry sawdust which the slugs do not like to crawl over, and it will keep moisture in the ground. A top covering of peat is also disagreeable to slugs, which I find very troublesome in biting the flower-stalks of Gladioli on sandy loam, but they rarely do so on a border of black earth.

16. COLLÁNIA.—Stem rigid, erect, curved at the summit; leaves rigid (not reversed?) umbel pendulous; germen turbinate, the operculous base of the style becoming enormously enlarged, and forming the main part of the fruit; perianth rather tubeformed, and not at all patent. (Pericarp probably soft and pulpaceous, since the fruit in at least one species is sweet and eatable.) Filaments and style straight?

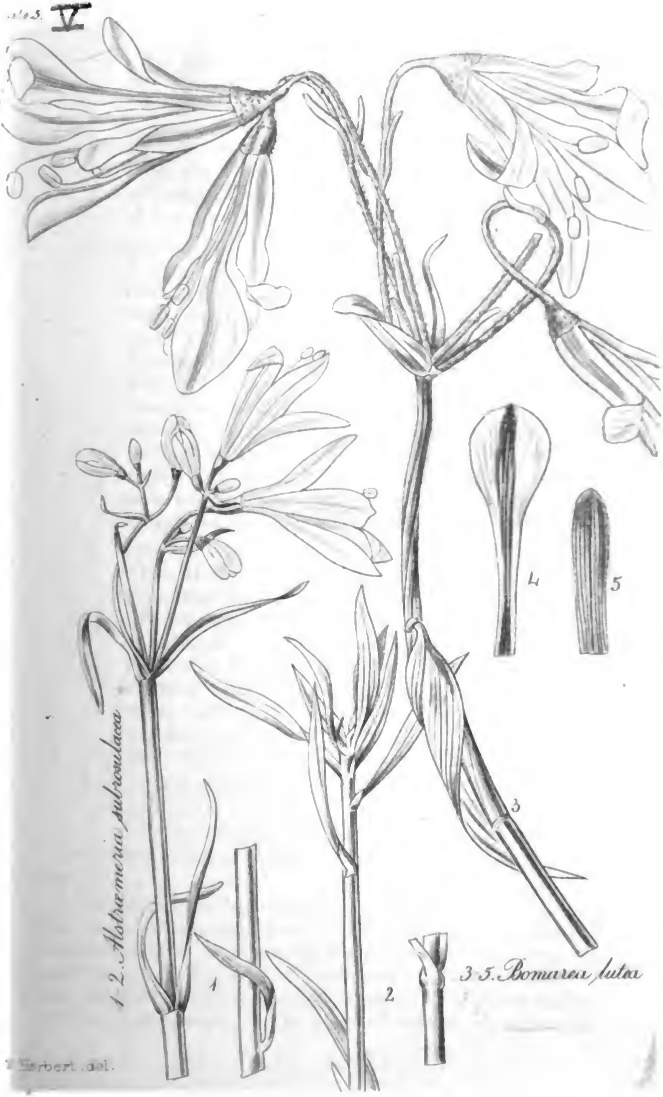
1. Involucrósa.—Pl. 9. Specim. Matthews, Peru, 863.

Alst. grandiflora. Herb. Hooker. Stalks 3-4 feet high, numerous, round, smooth; leaves 4 inches long, more or less, $\frac{3}{8}$ wide, crowded, attenuated at each end, ensiform or falcate, blueish green, lighter beneath, strongly nerved; involucral bractes much wider, darker green, more densely nerved, numerous (sometimes 16); perianth pendulous, pale yellow tinged with green, petals not spotted; filaments longer than the perianth, style still longer, stigma trifid; flowers 1 to many; root thick fibrous (growing at the foot of a shrub, or on the side of a rocky precipice). Found near Culluay? and St. Mateo in November. Specimens, Matthews, 863. Herb. Lambert, and Herb. Lindl. In the former, the involucral bractes are much narrower.

2. Dúlcis.—Pl. 7. fig. 1—9. Alstr. dulcis. Hooker B. Misc. Alst. uniflora. Matthews MS. Stalk 5-14 inches, smooth; leaves suberect, $\frac{1}{2}$-1$\frac{1}{2}$ inch long, a line wide, margins reflex, glaucous green, glossy; peduncles one or two, 1-2 flowered; perianth near $\frac{7}{8}$, sepals light red, tint between crimson and scarlet, tipped with green; petals yellower with more green, and a border of yellow speckled. Flowers generally solitary, sometimes four. This plant is called Campanillas coloradas, and the fruit is sweet and agreeable to the taste, and much sought by children, "the seeds being enveloped in a reddish gelatinous substance;" by which I understand that it has a pulpaceous pericarp, as the case is with Tamus and Hæmanthus. It grows beneath rocks at Huayllay, near Pasco, at an elevation of from 12 to 14,000 feet. It appears (see fig. 2.) to have a creeping rootstalk with small pyriform tubers appended.

3. Glaucéscens.—Pl. 10. fig. 1, 2. Specim. Jamieson. Herb. Hooker. Paramo of Cayambe. Alst. Glaucescens. H. and B. Kunth, 3. 282. Stalk 1-2 feet high; leaves numerous, erect, lanceolate, acuminate, sessile, rigid, glaucous, downy underneath, 1$\frac{1}{2}$-2 inches long or less, pressed close to the stalk, the upper widest; involucral leaves widest; peduncles 4-6, half an inch long, smooth, with shorter

No 5. V



1-2. Alstroemeria subrosulacea

3-5. Bomarea lutea

T. Herbert del.

lanceolate bractes at their base; perianth smooth, not half an inch long; sepals oblong, obtuse, scarlet, paler within; petals slenderer, yellow with rusty spots; filaments shorter. "This plant is found also on Chimborazo and on the ridge of Assuay." *Jamieson MS.* Found by Humboldt on the slopes of Pachincha, between Palmacucha and the spring of Cantuna.

4. Andimarcána.—Pl. 8. fig. 1. Specim. Matthews, Peru, 1164. Herb. Hook. Stalk smooth; leaves numerous, 4 inches long, scarcely $\frac{3}{8}$ wide; margin reflex, attenuated at both ends, acute (probably glaucous), with thick white down underneath; two broader involucral leaves; peduncles three, 1-2 flowered; common peduncle strong, bearing a lanceolate bracte $1\frac{1}{2}$ long, secondary slender; perianth $1\frac{7}{8}$ long, sepals oblong, seemingly red tipped with green, about $\frac{3}{8}$ wide; sepals spatulate, yellower tipped with green; anthers just exceeding the limb, style a little longer; stigma very little cleft. Found in July on the lofty mountains of Andimarca.

5. Pubérula.—Pl. 11. fig. 1. Specim. Matthews, Peru, 1165. Herb. Hooker. Stalk downy; leaves numerous, suberect, paler underneath; downy on both sides, margins reflex, 3-4 long or more, about 3-16ths wide, acute; involucral leaves wider; peduncles 5, slender, 2-3 flowered, with a lanceolate bracte at the fork; perianth an inch long, sepals oblong, $\frac{1}{4}$ wide, seemingly red with a green tip, yellow within; petals yellower with more green at the end; style and filaments shorter than the perianth.

Var. 2. Aciculáris.—Pl. 2. fig. 2. Spec. Matthews, Peru, 1165. No. 2. Herb. Hooker. Leaves $2\frac{1}{2}$-3 inches long, scarcely a line wide; peduncles 2, 2-flowered.

Both were found in July on the high mountains of Andimarca.

It is much to be lamented that seeds of the Collanias, as well as numerous species of splendid Bomareas which are herein described, have not been gathered by collectors, and remitted to Europe; most of them would live out of doors in England with a little covering in winter of sawdust, leaves, or ashes, and probably in the south of Europe would require no care, except perhaps watering in dry summers. We possess only, as far as I know, the tender edulis, the Chilian salsilla, and the Mexican hirtella and acutifolia, unless a Chilian variety of ovata figured in the Bot. Mag. be in this country. B. hirtella will live well at the foot of a south wall, sawdust being heaped over the roots in winter. With me it flourishes against the front of a greenhouse, and twines up a pole to the height of about eight feet. Acutifolia has lived through a winter in the same situation, but it does not go to rest like hirtella for six months or more, and therefore is much more liable to injury, and requires more protection, but it is impatient of heat under glass in the summer. Its root is less tuberous and substantial, but it will succeed in an open border if set deeper and covered with leaves to protect it from the frost. There is a rage at present for the introduction of Orchideous plants, of which the greater part cannot compare with the Amaryllidaceous in beauty, and require a degree of heat, and a damp atmosphere, which is very unpleasant to the cultivator, and no pains are taken to introduce the rich variety of splendid plants in this natural order, which the western continent possesses in its temperate and even cold regions. I wish that I could excite some of our wealthy cultivators to turn their thoughts to the acquisition of the plants here described, and their numerous kindred, which are profusely scattered over the slopes of the Andes, and waste their beauties in the woods, as yet unnoticed by any European traveller.

17. Sphǽrine.—Stalk straight, attenuated upwards; peduncles simple; sepals equal; petals equal; style and filaments straight (leaves subrigid; perianth under an inch); capsule indehiscent.

A perfect diagnosis of the genus cannot be obtained; the perianth and germen appear to conform with the smallest flowered Bomareas, but on the authority of Ruiz all the species with a short straight stem have an indehiscent capsule, with a little pulp, and, if so, they cannot be Bomareas; and, whenever they can be inspected, further differences will be found. The specimen with fruit, probably immature, in Mr. Lambert's herbarium (see Pl. 12. fig. 4.) *has the fruit spherical, quite unlike that of Bomarea. Imperfect as my knowledge of this genus is, I cannot set down as Bomareas plants which are asserted to have an indehiscent capsule. I believe that a material* *difference will be found at the base of the style, and that the germen is much less operculate; but that is conjectural.*

1. Distychophýlla.—Pl. 12. f. 3.4. Specim. Ruiz. Herb. Lambert. Alstr. distychifolia. Flor. Peruv. 3. 60. sed non t. 287. fig. pessima ex Bomareæ tomentosæ var. Pangoensi, vel. B. setaceâ, conflata.—Stalk solitary, filiform, 2 feet high; leaves 2½ to above 3 inches long, about ¾ wide, lance-oval, with five hard nerves and six pair of weaker intermediate nerves, alternate, two usually opposite at the summit; petiole about ⅛ long; the lower leaves less; involucral bracte one or more, subulate, small; peduncles 3-6, ½ an inch to 1¼ long; perianth ½ an inch long, purplish red; petals a little wider, blunt, with a small point; capsule ovate, obtusely triangular, furrows nearly obsolete, not dehiscent; seeds roundish, yellow, with little pulp. In the woods of the Peruvian Andes, in the high cold mountains of Munna. The name distychifolia being a compound of Greek and Latin, is necessarily corrected. Ruiz's specimens of distychophylla, in Mr. Lambert's herbarium, were confounded by him with specimens of Bomarea setacea, and the figure in the Flora Peruviana, which does not agree with the description, has been taken from a wrong specimen, and does not represent the plant of which it bears the name.

2. Secundifólia.—Pl. 12. f. 1. 2. 5. Spec. Ruiz, Herb. Lambert. Alst. secundifolia, Flor. Per. 3. 60. t. 290. Stalk solitary, filiform, two feet high, glabrous, pendulous; leaves alternate, 1½ palm long, 1 inch wide (in the specimen there are two opposite at the top, which seems usual in this genus, near 3½ long, ⅝ wide, much less ovate); the inferior smaller, underneath downy; peduncles 4-6, 1½ inch long; involucral bractes small, subulate; perianth ¾ long (½ an inch, Ruiz in the text, wrong); sepals downy without, purplish red, obovate, a little widest; petals cuneiform, yellow with black spots and a green tip; germen and stigma downy; capsule hexangularly oblong, with the alternate angles fainter, not dehiscent, yellow,

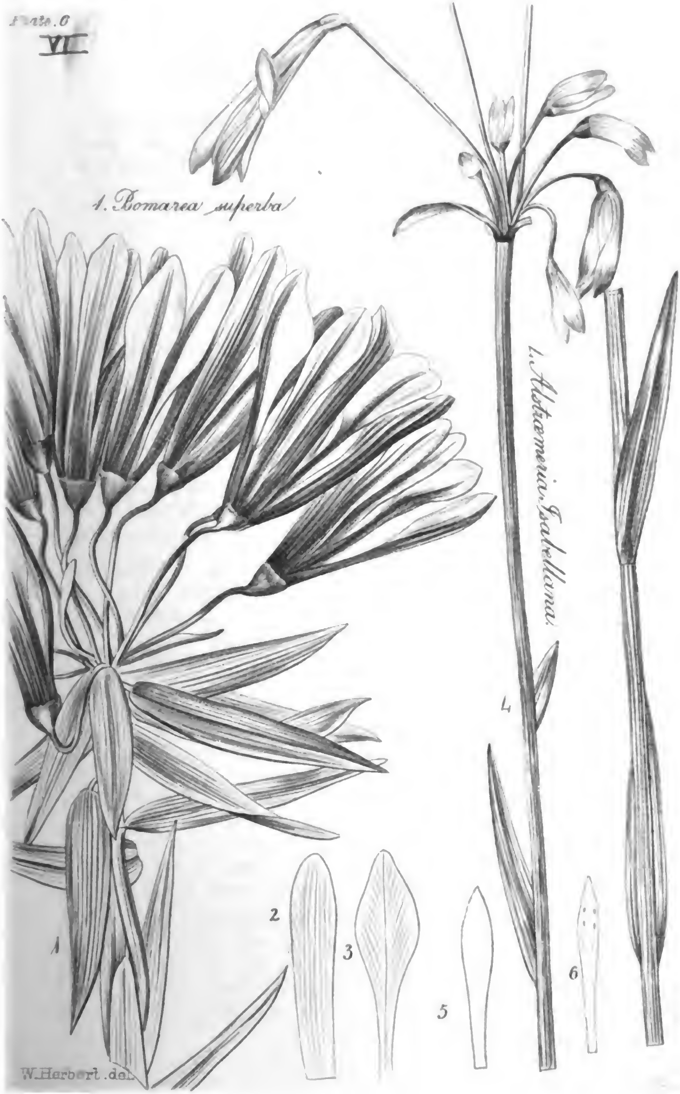
wrinkled, rough; seeds roundish, obovate, red, (nestling in pulp?) In the woods near Munna, as well as the last.

Ruiz's descriptions appear to me generally accurate, but the figures in his work the very reverse: I think, however, that he was probably wrong in saying that the seeds nestle in pulp, which is the true definition of a berry, as that of a currant, &c.; but I have found no berry in this order. Whether the seed, like Bomarea, or the pericarp, like Tamus and Hæmanthus, has a pulpaceous coat, remains doubtful.

3. Coccínea.—Pl. 16. fig. 1. Alst. Coccinea. Flor. Peruv. 3. 62. t. 291. Stalk 3 feet high, with ovate scales below the middle, flexible upwards; leaves alternate, villous underneath, smaller near the summit, 2 opposite at top; bractes none; peduncles villous, two inches long; perianth half an inch long; sepals oblong, scarlet with a green tip, petals cuneiform, greenish yellow with purple spots; capsule downy, oval, not dehiscent; (seeds nestling in pulp?) In the woods of Huassahuassi, Peru. The outlines I have given of this, and the capsule of secundifolia, are taken from the Flor. Peruv. I have seen no specimen of Coccinea.
4. Nervósa.—Pl. 13. Spec. alterum. Matthews, 1661. Herb. Hooker. Leaves alternate, 4-4½ inches long, ovate, lanceolate, acutely attenuated, ¾ wide; 29 principal nerves equal, with a like number of alternate inferior ones; two upper leaves opposite, and two opposite bracte-like leaves much smaller, half an inch above; interior bractes filiform; peduncles 19-20, 1¼ inch long, downy; germ downy; perianth half an inch long (seemingly red, yellow, and green).
5. Brévis.—Pl. 18. fig. 1. Spec. Matthews, Peru, 1660. Herb. Hooker. Stalk 14 inches, a little spiral near the top; the lower half scaled, the lower leaves less; leaves lance-oval, attenuated at the base, strongly nerved underneath, three inches or more long, half an inch wide, alternate, two upper opposite, and two smaller bracte-like leaves above opposite; interior bractes small; peduncles three, ¾ of

Plate 6

VI


1. Bomarea superba
4. Alstroemeria Isabellana
1
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W. Herbert. del.

an inch, a little downy, as well as the germen; perianth half an inch (seems orange and green), sepals horned.

I have no knowledge of the fruit of either of the two last species, being only acquainted with the specimens of which I have given the outline; but I venture to predict that, if the statement of Ruiz concerning the capsule of the three former, which I have no reason to doubt, be correct, the fruit of these two will be found indehiscent also. Concerning the first I could entertain no doubt; the spiral twist near the top of the stem of brevis at first gave me the idea of a Bomarea, but, after I had long studied it, I felt assured that it was not. It will be observed that all five agree not only in having the lower part of the stem scaled and the first leaves smaller, but in having the rest alternate, except the two upper, which are opposite, a feature that does not occur in Bomarea; that all have short simple peduncles, and secundifolia, which has the perianth $\frac{3}{4}$ of an inch long, is the only one in which it exceeds half an inch. As far as we know, they are said to have solitary stems. The two new species having smooth leaves should properly follow distychophylla, but are placed at the end, on account of the want of certain knowledge of their fruit.

18. Bomárea.—Stalk twining; germen triangularly turbinate; segments of the perianth inserted in deciduous glands on the germen; sepals nearly equal, petals nearly equal unlike the sepals; capsule valveless, coriaceous, triangularly turbinate, six furrowed, with an obtuse opercle, when ripe wrinkled; the dissepiments entire, the opercle widely dehiscent; seeds adhering long after maturity, roundish, tapering at one end, outer coat soft (perhaps always red or yellow); middle coat pulpy, inner coat brownish, adhering to the horny albumen; umbilicus a little pointed; raphe inconspicuous, chalaza annular on the inner coat, scarcely visible on the outer, opposite the foramen; umbilical cord entering the raphe nearly half way between them; (root more or less tuberous?)

The style of Bomarea, as far as I know, is tripartible; but I have no confidence in the invariability of that feature, which is irregular amongst the Narcisseæ. Salsilla has a decided flexion of the filaments, which, if it exists in Hirtella and Acutifolia, must be more equivocal; but we are acquainted with so few of the species in a fresh state, that I cannot properly investigate this feature. In the Alstrœmerieæ, the filaments seem to change their altitude so much at different periods, that it is difficult to assign a posture to them. The capsule of Salsilla agrees with that of Hirtella and acutifolia. I have not seen its ripe seed.

§. 1. Peduncles two-flowered or more.

§§. Perianth nearly equal.

A. *Leaves smooth, flowers about half an inch long, crowded.*

1. Salsílla.—Feuillet Obs. 2. 713. t. 6. var. 1. obtusa. Alst. oculata. Bot. Mag. 61. 3344. Lodd. Bot. Cab. t. 1851.

Var. 2. Præcípua.—Plate 16. fig. 4. foliis majoribus. Herb. Hooker. Cumming, 345. Valparaiso.

Var. 3. Subfalcáta.—Pl. 16. fig. 5. Herb. Hooker. Cruikshank, 33. Chili, Herb. Hooker. Cumming, 345. Herb. Lindl.

Flowers purple with a dark eye-like spot on the lower part of the two upper petals, and a paler one on the lowest. It has a strong flexion of the filaments. Salsilla was first figured and described by Feuillet together with Alst. ligtu and peregrina, all three stated to be Chilian plants. By a strange mistake, when Bomarea edulis and Alst. caryophyllæa, both tender tropical plants, were brought from the East coast and West Indies, they were confounded with Salsilla and Alst. ligtu, and have usurped their names in our stoves and in modern botanical works. It so happens that, numerous as the genus Bomarea is in the higher latitudes, not a single species, except Salsilla, and Ovata var., has been discovered in Chili, unless the specimens in Professor Lindley's herbarium from Conception, gathered by Macrae in 1825, with the flowers not blown, and varying in leaf from lanceolate-acute to lance-ovate, be B. glomerata, which is a Peruvian species, and approaches to Salsilla in leaf. It is quite certain that the edulis of Tussac, which has usurped the name, is quite distinct from Feuillet's plant, and the original name must be restored to the Chilian twiner, which has been since figured as oculata. The name oculata is therefore to be altogether expunged. B. salsilla is a hardy greenhouse plant, of which the seedlings vary very much in brightness of colour and in leaf. I have not found Salsilla amongst the Peruvian specimens.

B. *Leaves smooth, flowers middle sized, umbel loose.*

2. Edúlis.—Tussac Fl. des Antill. 28. Alst. Salsilla. Bot. Mag. 39. 1613. Bot. Rep. 649. Vandesia. Salisb.

Var. 2. grándis. Specim. Herb. Hooker. Brazil, Mr. Booz. Peduncles long, three or four flowered. Salsilloeides, Martius ap. Schultes. In hedges near Rio Janeiro. This is Booz's plant, certainly not distinguishable as a species. The name Salsilloeides, being founded on the original error, cannot stand.

Var. 3. Maranénsis.—Specimen Herb. Lindl. Maranhao, Hesketh. Taja de bibro. Leaves 3¾ inches long, not ⅓ wide, acute, peduncles above two inches long, simple, with a diminutive bracte half an inch from the base.

Linnæus probably confounded this plant with salsilla, in consequence of having received some dry specimen at a time when salsilla was considered to be the only twining Alstrœmeria, and without sufficient examination he supposed his specimen erroneously to be Feuillet's plant. The tubers are said by Tussac to be eaten in St. Domingo like those of the species of sunflower called Jerusalem artichoke. It is a stove plant. If Maranensis should prove to have always simple peduncles, with such narrow leaves, it must be removed from its place as a variety of edulis to the second section. I am inclined to separate it.

Poeppig says he found edulis (salsilla B. M. 1613) fl. Oct. Dec. in coppices, S. Chili, 7000 f. alt. Strange, if the W. Indian plant be found in such a situation. It was probably ovata var. B. M. 2848.

3. Caraccénsis.—Pl. 16. f. 2. Specim. Fanning, Herb. Lambert. from Caraccas. Leaves smooth, lanceolate, acuminate, six inches long; peduncles about six inches long, two-flowered, branching near the end with a small bracte; involucral bractes lanceolate, about 2½ inches long; perianth about an inch long, sepals apparently red, petals green spotted. It must be closely allied to edulis, and may perhaps be more properly called a variety of it.

C. *Leaves smooth, flowers large, umbel crowded.*

4. Formosíssima.—Pl. 14. f. 4. Ruiz, Specim. Herb. Lambert. Als. formosissima, Flor. Per. 3. 64. t. 296.

This magnificent plant is said to produce an umbel with from 36 to 80 flowers, of a purplish red and yellow, the petals being richly spotted. The stalk grows 12 feet high, and the leaves are an inch wide and very acute. It grows in the woods of the Peruvian Andes near Munna.

D. *Leaves smooth, flowers large, umbel loose.*

5. Pauciflóra.—H. and B. Kunth, 3. 285. Leaves scattered, acuminate, two inches long or more, one wide; petioles three lines, peduncles four, 4-5 inches long, 2-3-flowered; bractes lanceolate, not an inch; sepals two inches (purple?) petals orange? Near Santa Fe de Bogota on the slopes of Mount St. Quadalupe.

E. *Leaves pubescent, flowers about an inch, umbel loose.*

6. Bracteáta.—Pl. 3. f. 3. Specim. Ruiz, Herb. Lambert. Alst. bracteata, Flor. Per. 3. 61. t. 291. The figure in the Fl. Per. is very incorrect and greatly exaggerated in size, on which account I have given an exact outline of a portion of Ruiz's own specimen. Involucral bractes five, lanceolate; leaves lanceolate with a spiral point; peduncles five, long, 2-3-flowered, bracteate; sepals purple tipped with green, petals spatulate, green speckled with purple, yellow at the base. In the woods of Huassahuassi, Peru.

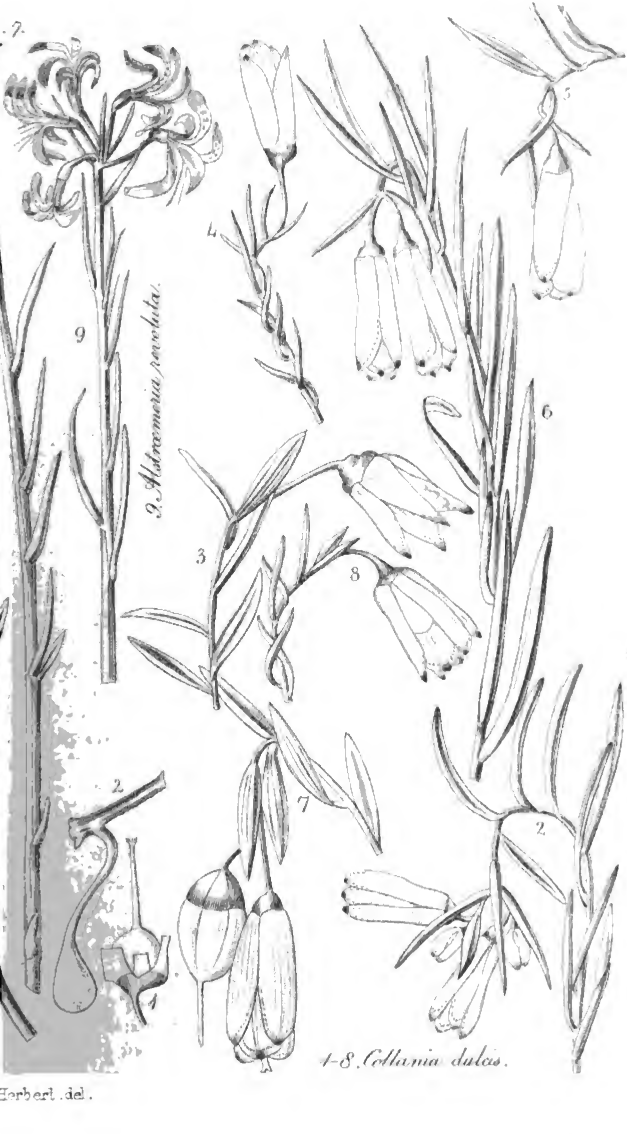
7. Acutifólia.—Bot. Mag. 58. 3050. Leaves slightly haired on the nerves beneath, lanceolate, acuminate, half an inch wide or more; peduncles 1-2-flowered; sepals red, petals orange. Mexico.

8. Obováta.—Pl. 14. fig. 2. Spec. Col. Hall, 7. Herb. Hooker. "Road of Angus, Peru, at the height of 4000 feet; flowers crimson." Perianth 1¼ inch, sepals crimson; petals spotted, some tipped with green; involucral bractes lanceolate, acuminate, 3½ inches long, near an inch wide, lesser 2¼ inches wide; peduncles 8 inches long, 4-flowered, bracteate at the forks. The leaves and rest of the umbel are wanting.

9. Hirtélla.—Sweet, Brit. Fl. g. 228. H. and B. Kunth, 3. 284. Gloriosa, Deppe et Schiede ap. Schlecht

Tab. 7.

VII



9. Alstroemeria revoluta.

1-8. Collomia dulcis.

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Linn. 6.51. Spec. Herb. Lamb. Ovata, B. M. 2848? Stem about 7 feet high; leaves 4 or 5 inches long, lanceolate, acuminate, with a harsh pubescence underneath; peduncles 5-7, 1-3-flowered, 4-6 inches long; sepals red; petals green spotted with red; stamens, germen, and base of the petals, pubescent. Between Mexico and Tingello on the road to Tolucca. This fine plant thrives well in England at the foot of a south wall, or against the front of a greenhouse, with the precaution of pouring a small heap of sawdust or coal-ashes over it in the winter to keep the frost from the root. It lies at rest through the winter, and late in the spring the shoots rise like asparagus. It ripens its seed, unless the season is very unfavourable.—Chili?

10. Latifólia.—Flor. Per. 3. 64. t. 295. Leaves a palm wide, a palm and half long; peduncles 7-14, a palm long, bracteate; perianth above an inch long; sepals red tipped with green, petals green speckled and streaked with purple. In Peru on the hills near Atiquipa called Lomas.

11. Cordifólia.—Flor. Per. 3. 64. t. 290. Stalk 2-3 yards high; leaves 4 inches long, nearly 3 wide, petiole three lines, peduncles six; involucral leaves ovate, lanceolate, acuminate; perianth an inch long, yellowish red; germen a little downy. In the woods of the Andes of Peru by the road of Pozuzo.

12. Grandifólia.—H. and B. Kunth, 3. 285. Differs from cordifolia in a narrower leaf, longer petiole, shorter peduncles and leaves, not alternate. The colour of the flower is not perfectly ascertained, and, as it is the native of a hotter climate, it is probably distinct.

13. Ováta.—Var. 1. Cavanillesiana. Cavanilles ic. p. 54. 76. Leaves alternate, with the edge revolute; peduncles about five, two-flowered, bracteate at the fork; sepals bright red tipped with green; petals green speckled with black. In Peru.

Var. 2. Tatiána.—Pl. 15. fig. 3. Specim. Mexico. Herb. Hooker. Cervantes Mexico. Herb. Lambert. Leaves 3½ inches long, 1¼ broad, ovate, acutely acuminate;

petiole $\frac{3}{8}$ long; involucral bractes four, conformable, smaller; peduncles five, 3 inches long, bracteate at the fork and below the secondary flower, therefore probably occasionally three-flowered; perianth $1\frac{1}{4}$ long, seemingly yellowish red and green; petals scarcely $\frac{1}{4}$ wide.—Ovata? Bot. Mag. see Hirtella.

Var. 3. Nóbilis. — Pl. 15. f. 2. Specim. Culb. Herb. Hooker. Leaves $4\frac{1}{4}$ long, $2\frac{1}{4}$ wide, ovate, acuminate, bractes four, conformable, smaller; peduncles $5\frac{1}{4}$ long, two-flowered, bracteate at the fork and on the secondary peduncle; perianth $1\frac{1}{4}$ long, petals above $\frac{3}{8}$ wide; sepals seemingly reddish yellow, petals yellowish green; approaches to cordifolia.

14. Macrocárpa.—Flor. Peruv. 3. 63. t. 294. Pillao in Peru. Spec. Matthews, Herb. Hooker, 483. At the roots of bushes. Huamantanga, Peru. April. Spec. Matth. Herb. Lindl. Leaves a palm long, an inch wide (in the specimens about three inches long, $\frac{7}{8}$ wide, lanceolate, acuminate); peduncles 6-18, (in the spec. four, 2-3-flowered); bractes small; perianth an inch (in the spec. 3-4ths); yellowish red. The leaves are more crowded and much less ovate than in the three foregoing; the sepals seem much redder, the petals more spatulate, speckled at the edge.

15. Hirsúta.—H. and B. Kunth, 3. 285. Leaves sparse, acuminate, paler underneath and hirsute, 4 inches long and more, $1\frac{1}{2}$ wide; petioles half inch; perianth crimson, sepals obtuse, 7 lines; petals longer, not an inch. On the woody mountains of New Granada, between Fusagasuga and Icononzo.

16. Cornúta.—Pl. 17. f. 4. Specim. Matthews, 1161. Mount Parahuanca, Peru, July; Herb. Hooker. Upper leaves subsessile, $5\frac{1}{2}$ inches long, $1\frac{1}{4}$ wide; a harsh down on the nerves underneath; a slender setaceous point; involucral bractes conformable, shorter; peduncles five, 9-10 inches long, bracteate at the fork 6-7 inches from the base, 3-4 flowered; bracte an inch or more, narrow; perianth an inch long, (apparently dark red?) sepals ending with a horn $\frac{1}{4}$ of an inch long, petals with a bristle.

§§. 2. Petals much longer than the sepals.

F. *Leaves smooth, flowers about an inch long, umbel loose.*

17. Díspar.—Pl. 17. fig. 1. Specim. Matthews, 1658. Herb. Hooker. Leaves lance-ovate, acuminate, strongly nerved, 8 inches long, 2 wide, petiole $\frac{1}{4}$; peduncles 5, near 5 inches long, 2-3-flowered, bractes slender, $\frac{1}{4}$ long; perianth an inch, petals one-third longer than sepals; sepals obtuse-oval, seemingly (orange?) tipped with green; petals less highly coloured, spatulate; involucral bractes almost obsolete.

§. 2. Peduncles one-flowered.

§§. 1. Perianth nearly equal.

G. *Leaves smooth, flowers about $\frac{1}{2}$ an inch, umbel crowded.*

18. Glomeráta.—Pl. 15. fig. 1. Spec. Peru, Matthews, 1662. (Do. 1661.) Herb. Hooker. Leaves about $2\frac{1}{2}$ inches long, $\frac{3}{8}$ wide, closely nerved, lanceolate, acute; petiole $\frac{1}{8}$, about $\frac{5}{8}$ apart; outer involucral bractes small, lanceolate, inner setaceous; peduncles about half an inch, perianth half an inch, apparently red, petals edged with orange. This plant in the dry specimens has much the aspect of B. salsilla, but may be readily distinguished by the thickness of its leaves, its short simple peduncles, and the different colour of its flowers. Matthews, 1662. Herb. Lindl. is a variety with the leaf $\frac{5}{8}$ wide, $4\frac{1}{4}$ long, with a very long slender point.

19. Tórta.—H. and B. Kunth, 3. 283. Leaves scattered, acuminate, $1\frac{1}{2}$ inch long, margin revolute; peduncles numerous, half an inch; sepals obtuse, red, half an inch; petals scarcely shorter, green spotted with black, yellowish at the base. In the cold parts of Peru, near Coxamarca and Parama de Yanaguanga.

20. Cumbrénsis.—Pl. 18. fig. 2. Spec. Jamieson. Herb. Hooker. found "between Cumbre and Juna at 9000 feet elevation; flowers light purple, tipped with green." Leaves numerous, lanceolate, 2 inches and less, $\frac{1}{4}$ wide; involucral bractes shorter; peduncles slender, about an inch, flowers about ten; perianth $\frac{3}{4}$ long; sepals obovate, seemingly reddish

with a green tip, petals spatulate, wider (green, except at the base ?).

H. *Leaves smooth, flowers about an inch long, umbel crowded.*

21. Fanningiána.—Pl. 16. fig. 3. Spec. Fanning, Caraccas. Herb. Lambert. Leaves about three inches long, and 11-16ths wide, growing smaller upwards; involucral bractes very numerous, reflex, lanceolate, $1\frac{1}{2}$ inch long; peduncles very crowded; perianth about $1\frac{1}{4}$ inch long. It seems allied to Bredemeyerana, which is densely pubescent.

22. Fimbriáta.—Flor. Peruv. 3. 63. t. 293. fol. vix pub. Leaves lanceolate, alternate, very acute, near three inches long and one wide; petiole 3 lines; flowers 25-50 or more; bractes as many, lanceolate, reflex, inner less; peduncles an inch; perianth near an inch, yellow variegated with orange; petals tipped with green, fimbriated on the margin.

Var. 2. Paltaruménsis.—Spec. Matthews, Paltarumi, Peru, 867. Herb. Hooker. Stem climbing, 18-20 feet; leaves closely nerved, $2\frac{1}{2}$ to $3\frac{1}{4}$ long, $\frac{3}{8}$ wide; perianth a little above an inch, probably redder than Ruiz's fimbriata; petals spotted with deeper colour. It has the reflex lanceolate bractes, and peduncles a little more than an inch. The name Paltarumensis will equally distinguish it, whether it prove to differ more than I apprehend from Fimbriata or not. It flowers in Peru in December.

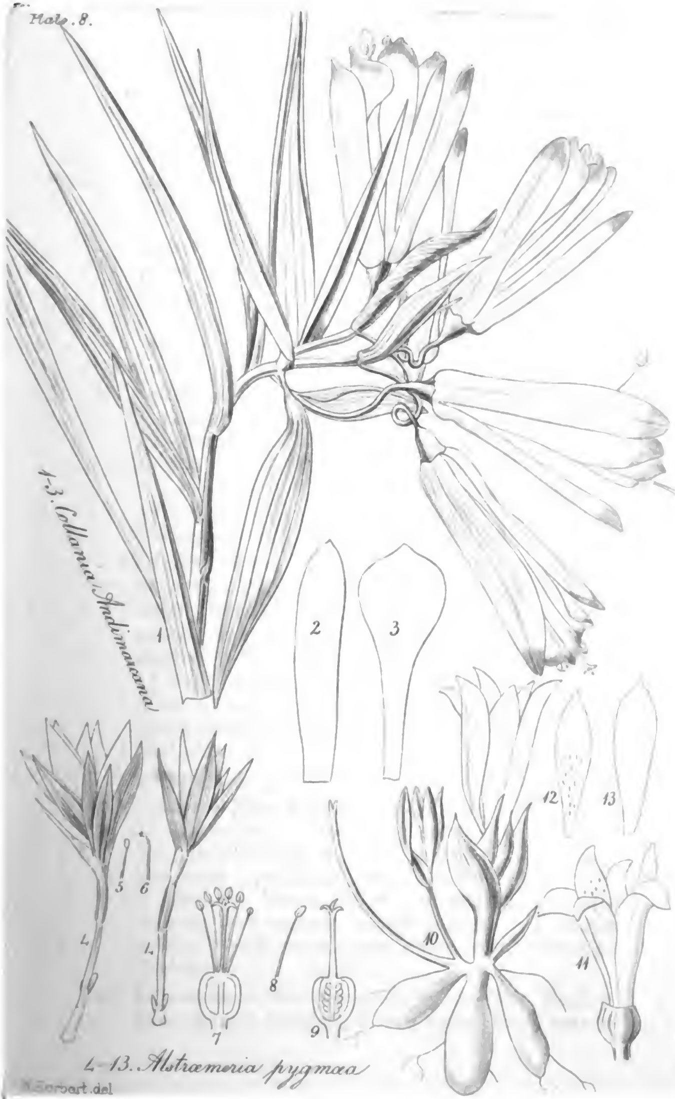
23. Floribúnda.—H. and B. Kunth, 3. 283. Leaves scattered, acuminate, two inches and a half long, half an inch wide; petiole short; peduncles one inch long; sepals pubescent without, tubercled at the point, an inch long (red ?) petals a little longer, (yellow ?) spotted with red; germen and style downy. On the temperate Andes near la Palmilla.

24. Anceps.—Flor. Per. 3. 61. Stalk slender, leaves alternate, lanceolate, spirally tipped; petiole short; peduncles about 17; perianth equal, intensely purple, within dark yellow with blackish purple marks. In the woods of Huassahuassi on the Andes of Peru.

I. *Leaves smooth, flowers about an inch long, few.*

25. Cornígera.—Pl. 17. fig. 2. Specim. Matthews,

Plate. 8.



1-3. Collania Andinamarcana

4-13. Alstrœmeria pygmæa

H. Gorbart. del

1659. Herb. Hooker. Stalk slender, leaves about $2\frac{1}{4}$ long, from $\frac{1}{4}$ to $\frac{5}{8}$ wide, lance-ovate, acute, petioles about $\frac{1}{8}$; peduncles 1-4, naked, about $1\frac{1}{2}$ long; perianth not an inch long, (seemingly yellowish?) sepals horned; involucral bractes, one larger, the rest small and acute. This plant is very unlike any other species. It is horned like cornuta, but very dissimilar in other respects. Its native spot is not mentioned, but it is a Peruvian plant. Var. Matthewsiana, Pl. 10. fig. 4. Matthews, 1659. Herb. Lindl. seems a different plant. It has larger leaves, four large involucral bractes, and four flowers, and, if horned, I overlooked the horns.

26. Halliána.—Pl. 10. fig. 3. Specim. Col. Hall. 20. Patacocha, Herb. Hooker. Leaves about $4\frac{1}{2}$ inches long, above half an inch wide, spirally acuminate; bractes narrow, near an inch long; peduncles about six, $1\frac{1}{4}$ long; perianth an inch, seemingly yellowish red; sepals oval $\frac{7}{8}$; petals wide, spatulate, an inch long; stalk, peduncles and germen pubescent.

K. *Leaves smooth, flowers large, crowded.*

27. Supérba.—Pl. 6. fig. 1. Specim. Matthews, Peru, 1663. Herb. Hooker. Stalk smooth; leaves two inches or more, $\frac{1}{4}$ wide, closely nerved; bractes smaller, peduncles about 12, $1\frac{1}{2}$ inch long, perianth $1\frac{3}{4}$ long, seemingly red and orange; it does not seem to have spots or green tips; sepals obtuse, petals spatulate, both about 5-16ths wide. A beautiful plant.

L. *Leaves pubescent, flowers about half an inch, crowded.*

28. Setácea.—Flor. Peruv. 3. 62. t. 292. Spec. Ruiz, Herb. Lambert. Stalk 3-4 yards; leaves lanceolate, $1\frac{1}{2}$ inch long, $\frac{1}{2}$ wide; bractes small, lanceolate, acute; peduncles 18-35, 1-2 inches long, with a setaceous bracte below the middle, perianth scarcely half an inch, sepals purplish red, petals yellow. In the woods near Pillao on the Peruvian Andes.

29. Tomentósa.—Flor. Peruv. 3. 62. t. 292. Stalk 4 feet, leaves 1-3 inches, 1 inch wide, closely nerved

underneath; bractes small; peduncles numerous, bracteate at the base of the flower; perianth small, sepals scarlet, petals yellowish. In the woods at Munna and Pillao of the Peruvian Andes.

Var. 2. Ebracteáta.—Specim. Peru, Matthews, 1666. Herb. Hooker. With peduncles non-bracteate, the leaves three-quarters of an inch wide.

Var. 3. Pangoénsis.—Foliis angustioribus, umbellâ pauciflorâ. Spec. Peru, Matthews, 1162. (from the woods of Pangoa, July) Herb. Hooker. Leaves about 2½ inches long, scarcely ⅜ wide, more attenuated and acute; peduncles without bractes thereon, 1¼ long, about six; perianth ¾ long.

32, Denticuláta.—Flor. Peruv. 3. 62. t. 293. Stalk smooth, leaves 1-3 inches long, 1 inch wide, densely pubescent underneath; petioles 2 lines, repand denticulate; bractes small, peduncles numerous, perianth small (about ¾), reddish and yellow, segments equal; petals cuneiform. On the loftiest cold mountains near Patasaria in the Peruvian Andes. The figure in the Flor. Peruv. gives the margin of the leaves denticulate, which is probably an error. It seems closely allied to tomentosa, but the petals are probably a little less spatulate.

M. *Leaves pubescent, flowers about an inch, and crowded.*

31. Bredemeyerána.—De Schlechtend. fil. ap. R. et Schultes. Stalk thickly pubescent; leaves lanceolate, glaucous underneath; petioles short; peduncles numerous, pubescent, an inch long; involucral bractes 1 inch, reflex; perianth an inch, sepals a little shorter. Near Caraccas. See 21 Fanningiana, a native of the same country, glabrous with longer flowers.

32. Rósea.—Flor. Peruv. 3. 91. Stalk 5 feet high, smooth; leaves alternate, ovate-lanceolate, acute; petioles short; involucral bractes many, linear; peduncles about 18 with a subulate bracte at the middle; sepals rose-coloured with a green tip, petals greener with black spots towards the end. In the woods of Huassahuassi, Peru.

33. Purpúrea.—Flor. Peruv. 3. 63. t. 294. Stalk 18 feet

high, pubescent upwards; leaves lanceolate, a palm long, near an inch wide; bractes narrow; peduncles 20-60, 1½ inch, sometimes bracteate in the middle; perianth an inch long, purple, sepals cuneiform, petals spatulate.

N. *Leaves pubescent, flowers about an inch, few.*

34. Símplex.—Pl. 15. fig. 5. Spec. Matthews, 786. Herb. Hooker. misnamed by Matth. tomentosa. Leaves 2½ inches long, ovate, above an inch wide; involucral leaves very small; peduncles five; a small bracte thereon towards the middle; perianth an inch long. This plant is much more allied to ovata of Cavanilles than to tomentosa, but it differs in having one-flowered peduncles, though the bractes indicate a disposition to form a secondary one. Found near Purruchuco in Peru.

O. *Leaves pubescent, flowers large, peduncles long.*

35. Crinita.—Pl. 15. fig. 4. Spec. Matthews, Peru, 1664. Herb. Hooker. Stalk downy; leaves harshly nerved, about 4 inches long, ¾ wide, lanceolate, acute; petioles near ¼; involucral bractes an inch, like hairs or bristles; peduncles ten, 6 inches long; perianth 2 inches long, seemingly red and orange.

P. *Leaves pubescent, flowers large, crowded.*

36. Crócea.—Flor. Peruv. 3. 61. Stalk 18 feet high, smooth; leaves linear, lanceolate, sessile, very acute, a palm and a half long, 4 lines wide; involucral bractes many, broader, but thrice shorter; peduncles arcuate, downy; perianth 1½ inch, equal, saffron-coloured. In the woods at Chumpulla in the Peruvian province of Tarma.

§§. 2. Perianth very unequal.

Q. *Leaves smooth, flowers large, crowded.*

37. Caldasiána.—Alstr. Caldasi. H. and B. Kunth 3. 283. Stalk smooth, leaves ovate, lanceolate, rather rigid, acuminate, 3-3 inches or longer, an inch wide or nearly; peduncles 1½ inch, sepals tubercled at the point, scarlet, 9 lines long, petals much more than an inch, orange spotted with red; germen and

style downy. In temperate situations near Alangasi, Piso, and Chillo of the province of Quito.

R. *Leaves downy, flowers large, crowded.*

38. Pardína.—Pl. 14. fig. 1. Spec. Col. Hall. 19. Herb. Hooker. Leaves thickly pubescent underneath, lance-oval, spirally acuminate, 2½ inches long or more, 1 or more wide on the upper part of the stem (inferior leaves unknown); peduncles about 20, ¾ long; involucral bractes, two outer leaf-like, interior filiform; sepals 1⅝ long, petals richly spotted near 2½ long. Found at Patacocha on the western declivity of the Andes, at an elevation of 6000 feet. A superb species.

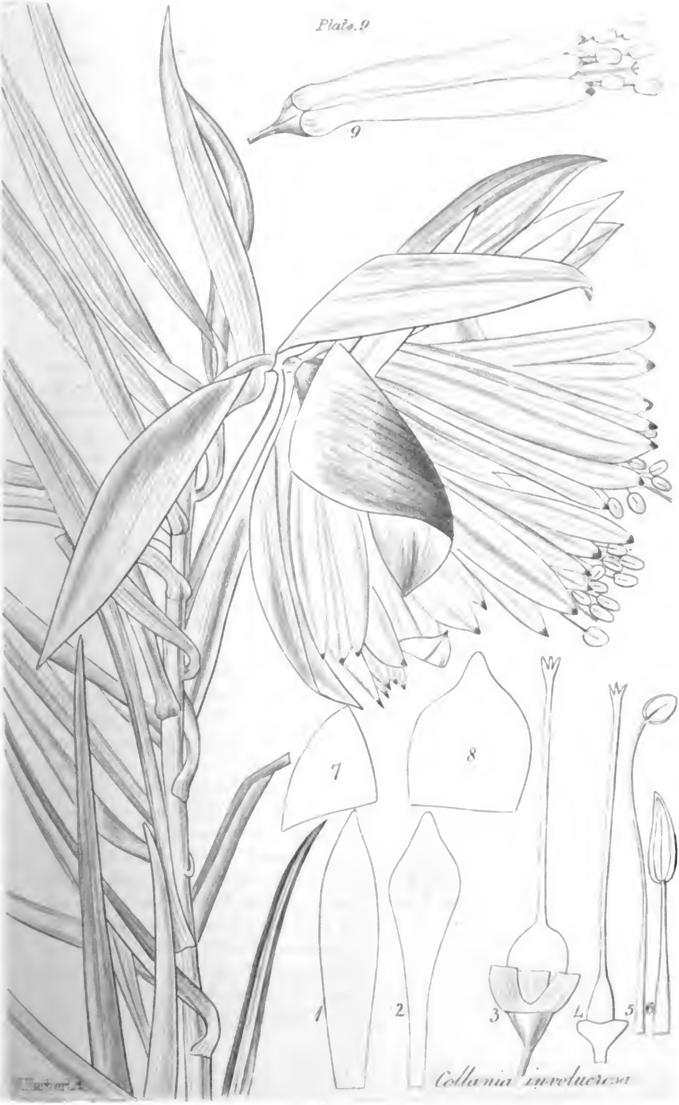
39. Patacocénsis.—Pl. 14. fig. 3. Spec. Col. Hall. Herb. Hook. Stalk a little downy; leaves lanceolate, 1½ inches long, ¼ wide, frequent near the summit; involucral bractes broader, few; peduncles slender, 30 or more, 2 inches long or more, naked; germen small, downy; sepals an inch and 3-16ths, narrow, obtuse, about 3-16ths wide; petals about an inch and 9-16ths long, half an inch wide upwards, spatulate; longest filaments nearly as long as the petals. Perianth seemingly reddish yellow? sepals rather redder? a green spot at the point of the petals? Another magnificent plant also from Patacocha at the same elevation.

S. *Leaves downy, flowers large, flowers few.*

40. Lútea.—Pl. 5. fig. 3. Spec. Col. Hall, 14, No. 4. Herb. Hooker. Stalk downy; leaves upwards 2¼ long, not ½ wide, lanceolate, very little pubescence; involucral bractes near an inch long, narrow, downy; a bracte above half an inch long, downy near the middle; germen downy; perianth ("bright yellow," *Col. Hall.*) segments with darker longitudinal stripe; sepals narrower about 1¼ inch long, petals near two inches, above half an inch wide upwards. A beautiful species found by the road to Mindo on the western declivity of the Andes at an elevation of 9000 feet.

The greater part of these beautiful plants are natives of elevated situations and dislike a high temperature. They will be found to thrive best out of doors in this country in

Plate. 9



Collania involucrata

summer time, and will endure the winter if planted pretty deep in light soil and covered over with leaves in the cold season, especially if any sloped heading be laid on to throw off the wet. Even Acutifolia, which in the greenhouse keeps its leaves through the winter, will succeed with that treatment.

The genus Bomarea was named by Mirbel, who divided it from Alstrœmeria, founding the separation on edulis, erroneously named salsilla, ovata, and multiflora, a species which cannot be identified and must be altogether erased, having been described only from a drawing. Poiret (suppl. encyl. meth. p. bot. t. 1. p. 677) states that Mirbel's character of Bomarea was *perianth and filaments straight*, *capsule rounded and flattened from top to bottom;* of Altrœmeria *sepals reflex? (renversées) filaments curved*, *capsule lengthened*, which appeared to Poiret insufficient. Mirbel was on the right scent, but he had not laid hold of the substantial differences. The filaments of B. salsilla are much bent. The elongation of the capsule is a weak feature, and varies in the different species of Alstrœmeria.

Suborder 3. AGAVÉÆ.—Schistandrous, not operculate.

§. 1. DIOSCOREÆFORMES.—Inflorescence axillary, spicate. Plants tuberous, climbing, diœcious, with the veins of the leaves usually, but not always, confluent. (Petiole articulate?)

Dr. Lindley relies on the articulation of the footstalk of the leaf in Dioscoreæ, and a small portion of Smilaceæ, including only Smilax and Ripogonum, of which I believe but one species is known, for the character of an order, and even of a group of orders; but I doubt there being such a decisive difference between Dioscorea and Bomarea; and if it were established, I do not see how such weight can be attributed to that feature, while articulations of the seed-pod are not considered of sufficient importance to effect a like separation. I believe that the axillary inflorescence will be found a constant feature in the plants I have characterized as Dioscoreæformes. Dioscoreæ may be taken as a third suborder, and Agaveæ confined to Ixiæformes and Agaviformes, if it be thought preferable. It is immaterial, except with a view to consistency, when the other orders shall have been rectified and arranged.

19. Támus.—Perianth deeply cleft, patent, regular; contracted above the germen in the female; pericarp with the outer coat valveless, the flesh-coat pulpy, the inner coat with valves bearing the dissepiments; seeds with horny albumen, (having some resemblance to those of Bomarea.) Plants with great tuberous roots; veins of the leaves confluent.

1. Commúnis. Engl. Bot. 91.—2. Crética. Willd.

20. Testudinária.—Perianth deeply cleft; limb regular, half-patent, reflex; filaments erect, subulate, enlarged at the base, inserted in the base of the segments; anthers roundish, erect, adnate. Natives of Africa; root with square angular prominences. The male inflorescence is spiked, the female flowers said to be usually solitary. The veins of the leaves are confluent.

1. Elephántipes.—Bot. Reg. 11.921.—Tamus. Bot. Mag. 23. 1347.

2. Montána.—Burch. trav. Leaves glaucous.

21. Dioscoréa.—Perianth deeply cleft (*Hook. Bot. Mag.* 55. 2825.) in six segments, inserted in a bed shaped like the nave of a wheel on the disk or upper surface of the germen (*Salisb. Par. Lond.* 75.); filaments erect, equal; inserted (*according to Salisbury, and the engraving Bot. Mag.* 2825.) in the bed, (*according to Brown, Prod.*) into the base of the segments; (*Qu. which is correct? the same species, D. bulbifera, being described by both*); anthers roundish; style (or perhaps stigma) in the female deeply trifid; ovary 3-celled; cells 2-3-seeded; capsule compressed, with two of the cells sometimes abortive; seeds with a winged or foliaceous margin.

Obs. *If in truth there be species of Dioscorea differing from the rest in having the filaments inserted into the base of the segments, they should be transferred to Testudinaria, Dioscorea being distinguished by filaments inserted in the nave-shaped bed or disk; if, as Dr. Brown declares, the filaments in all are inserted into the base of the segments, Testudinaria can be scarcely separated by its angular root, and I can see nothing else to distinguish it. Sir W. Hooker's engraving of Cinnamomifolia (Bot. Mag.) represents the perianth, as he also describes* *it, to be only deeply cleft, and falsifies the generic character which calls it Sexpartitum, and it represents the filaments, as Salisbury described them, inserted in the bed. I have had no opportunity of ascertaining from fresh specimens to whom the error is attributable.*

1. Pentaphýlla. Willd. Rheede. Mal. 7. 35.—2. Triphýlla. Willd. Jacq. ic. t. 627.—3. Quinquéloba. Willd. Kæmpf. ic. t. 15.—4. Braziliénsis. Willd.—5. Heterophýlla. Hort. Beng.—6. Aculeáta. Willd. Rheed. Mal. 7. t. 37.—7. Rubélla. Hort. Beng.—8. Purpúrea. Hort. Beng.—9. Angustifólia. Spreng.—10. Nummulária. Willd. Rumph. Amb. 5. t. 162.—11. Aláta. Willd. Rheed. Mal. 7. t. 38.—12. Bulbífera. Par. Lond. 17.—13. Crispáta. Hort. Beng.—14. Altíssima. Spreng. Plum. ic. 117. f. 2.—15. Coriácea. Spreng.—16. Anguína. Hort. Beng.—17. Pulchélla. ib.—18. Atropurpúrea. ib.—19. Globósa. ib.—20. Fasciculáta. ib.—21. Glabra. ib.—22. Satíva. Willd. Rheed. Mal. 8. 51.—23. Piperifólia. Willd. Plum. ic. 117. f. 1.—24. Nepalénsis. Sweet H. Brit.—25. Cinnamomifólia. Bot. Mag. 55. 2825.—26. Quaternáta. Pursh. Walt. fl. c. 246.—27. Villósa. Jacq. ic. 626. Quináta. Walt. Paniculáta. Mich. fl. A. 2. 239.—28. Oppositifólia. Petiv. gaz. t. 31. f. 6.—29. Lúcida ? Brown. Prod.

The tubers of Dioscorea are eaten and called yams. The flower is very insignificant. Jacquin's figure of D. villosa makes the filaments bifid, each point bearing a detached cell of the anther which is bipartite. I cannot believe such an extraordinary feature, if correctly given, to be only a difference of species. A. Dioscorea, with large cordate leaves, at the Chelsea Garden, has 13 strong longitudinal veins, and the cross veins confluent, a little oblique, branching in various directions, some retroflex. Fifteen species, of which I have examined dry specimens, have the cross veins confluent, but those of lucida are most correctly parallel, very rarely bifid at the point, but in such case continuing their direction to the next rib or the margin, and never retroflex or running towards another parallel vein. Its fruit not having been seen, it is possible that it may belong to a separate, but closely allied, genus.

22. Rajánia.—Perianth deeply cleft, half-patent; contracted

above the germen in the female; capsule with a large incurved wing on one side; seed roundish, with a prominence. See Pl. 43. f. 53.

Obs.—I understand the perianth to be undivided at the base, the only feature mentioned, except its capsule and seeds, by which it can be distinguished from Dioscorea.

1. Hastáta. Willd. Plum. Am. 84. t. 98.—2. Cordáta. Willd. Plum. ic. 155. f. 1.—3. Quinquefólia. Willd. Plum. ic. 155. f. 2.

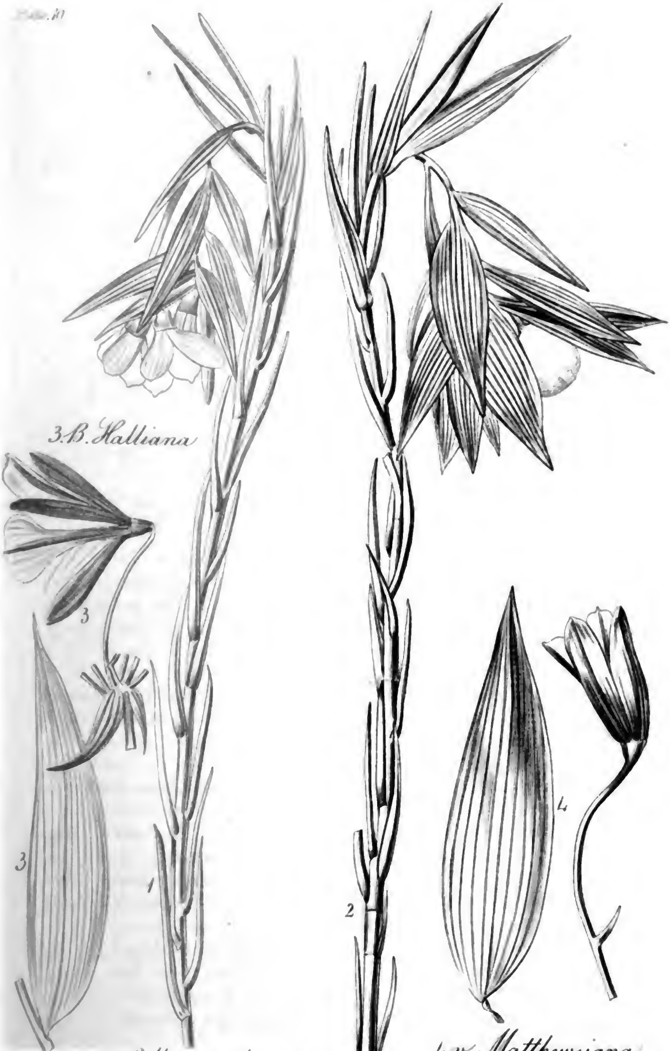
A leaf from the Chelsea garden, said by its able conductor to be certainly that of a Rajania (perhaps hastata), has three strong veins tending to the point, two weaker near the margin, the cross veins oblique and confluent, but none decidedly retroflex. Quinquefolia has three principal veins, and the lesser intermediate veins are represented oblique and featherlike, but not confluent. It must be observed that even the species of Dioscoreæform plants, which agree in not having the veins parallel, disagree amongst themselves as to their actual direction. When I alluded (above, p. 51) to the possibility of detaching Smilaceæ by an axillary inflorescence, I should have modified the term so as to include the inflorescence of Ruscus, which is borne on the margin of the leaf instead of the axill. That circumstance does not however interfere with the separation, being a still further removal from the other division, but it renders it more difficult to characterize the separation by a single word.

§. 2. IXIÆFORMES.—Root bulbous; pericarp not pulpaceous, (seeds with a horny albumen and hard shell?)

23. BRAVÓA.—Stalk spiked, bracteate; germen oblong, faintly triangular; perianth persistent; cylindrical, with the mouth of the tube widened, the segments of the limb very short, alternate segments smaller; filaments inserted at the base of the tube, filiform; anthers versatile; style thickened; stigma triangular; capsule oblong, 3-celled, 3-valved; seeds numerous, kidney-shaped, in two rows.

1. Geminiflóra.—Pl. 12. f. 8, 9. Spec. Herb. Lindl. De la Llave et Lexarsa, Nov. veg. desc. f. 1. 1824. Cætocapnia geminiflora (et Zetocapnia) Link et Otto. Pl. rar. h. r. Berl. p. 35. ic. 18. 1828.

Plate. XI


3. B. Halliana
3
3
1
2
4
1-2. Collania glaucescens
4. v. Matthewsiana
[illegible] del.

Peduncles axillary in pairs; perianth about an inch long, red; style just longer, stamens just shorter than the perianth; root said to be solid, that is, not a tunicated bulb, but a pear-shaped tuber, with inferior fasciculate small tubers; leaves keeled, spotted at the base. Native of Mexico.

24. Ixiolírion.—Stalk bracteate with peduncles axillary or terminal, 1-2 flowered; germen oblong, erect; perianth deeply cleft, (I believe not divided) regular, half-patent; alternate segments equal; filaments straight, inserted at the base of the segments, alternately equal; anthers versatile; style straight; capsule oblong, striped, 3-celled, 3-valved; seeds numerous, oval-oblong.

1. Montánum.—Pl. 20. fig. 3. Spec. ex Aleppo. Herb. Lamb.—Am. montana. Red. lil. 241. Labill. Syr. dec. 2. p. 5. t. 1.
2. Tatáricum.—Pl. 19. Spec. ex Altai. Herb. Lamb.—Am. Tatarica. Pall. it. 3. ap. 85. t. D. f. 1.

Var. Scýthica.—Pl. 20. f. 1. Specim. Cyananthes. Pallas. MS. Herb. Lindl. ex Scythiâ.

Montanum and Tataricum, as far as can be judged from the dry specimens, approach very closely to each other in the flower, which is probably blue in the whole genus; but Montanum, the Syrian plant, is distinguished by the remarkable feature of having a partly spiked inflorescence, contrary to the usual habit of the order, while the flowers of all the specimens I have seen of Tataricum are terminal. Redouté's figure represents Montanum with flowers from the axills of the bractes, though not so decidedly as the specimen I have sketched.

Tecophiléa?—Root small, bulbous, pear-shaped, with thready membranaceous integuments; leaves 1 or few; stem 1-few-flowered (perhaps never more than 2) germen oblong; perianth deeply cleft (regular? half-patent?) filaments, according to Bertero, three fertile, three abortive barren. I have not been able to see the filaments, and cannot learn whether the sepaline or petaline are abortive, nor whether they are ever perfect. I believe it rather to be a true triandrous plant with three processes between the stamens, and referable to Irideæ.

1. Violæflóra.—Pl. 24. f. 16, 17. Spec. ex Chili. Cumming et Bridges. Herb. Hooker.—Bertero lett. Bullet. de sci. nat.

§. 3. Agaviformes.—Semibulbous or stemmed; seeds flat, with a black or brown shell.

25. Fourcróya.—Bulb imperfect, or long-lived stem; germen oblong, attenuated below, drooping; perianth in six segments, regular, nearly patent, alternate segments equal; filaments (short) subulate, obovately thickened at the base, conniving; anthers versatile; style straight, hollow, triangular, enlarged below; stigma triangular, fringed; capsule oblong, oval, 3-valved, 3-celled; seeds black, numerous. [*I have had no opportunity of ascertaining with my own eyes whether the perianth is absolutely divided, but rely on the report of Zuccarini.*] See Pl. 34. fig. 20-25. Certainly distinct from Agave.

1. Longǽva.—(*Beyond all comparison the most magnificent plant in the order.*) Zucc. Nov. Act. Phys. Med. Ac. Cæs. Leop. Car. v. 16. p. 2. 666. ic. 48. Stem forty feet high, leaves in the form of Dracæna or Charlwoodia, less rigid and erect than Yucca; inflorescence terminal, 30 feet high, pyramidal, lower branches thereof 12 to 15 feet long; flowers white, innumerable, much like those of gigantea. Supposed to be 100 years, in all probability at least 50, coming to maturity. Native of the summit of Mount Tanga in Mexican Oaxaca, 10,000 feet above the sea, on slopes amongst oaks and arbutus, where the water is frozen for a long continuance in winter. Flowers in May and ripens fruit the following winter. There can be little doubt that this marvellous plant would flourish in this country. Karwinski has introduced it into Europe, and it may be seen alive at Mr. Loddiges at Hackney.

2. Gigantéa.—Bot. Mag. 48. 2250.—Dec. Pl. grass. 126. Agave fœtida. Willd.—3. Tuberósa. Comm. Hort. 2. f. 19.—4. Cubénsis. Jacq. Am. pic. t. 260. f. 25.—5. Rígida. Haworth. Syn.—6. Austrális. ib.—7. Madagascariénsis. Horneman.—8. Cántala. Haworth Suppl. China.

Mr. Decandolle rejected the genus Fourcroya because he had seen the filaments shorter and longer in different flowers of Agave vivípara; which is a most inconclusive reason. Length of stamens is a very variable feature, insufficient, I should think, in most cases to support a generic character, but that of Fourcroya does not depend on it. I have inserted filaments short in a parenthesis, as a feature probably pervading the whole genus, though not necessarily. A plant would be equally a Fourcroya, however long its filaments might be, with the formation described.

26. Agáve.—Bulb imperfect, or long-lived stem; perianth tubed, limb not patent; filaments adnate to the tube, filiform (long); anthers long, versatile; style triangularly filiform; capsule attenuated at both ends, 3-valved, 3-celled; seeds black, numerous.

§. 1. Germen cylindrically oblong, pedunculated, horizontal; limb funnel-shaped; filaments inserted at the mouth of the tube; stigma capitate, scarcely lobed. Genus Chlorópsis? Mihi. Spec. Lúrida. Pl. 33. f. 16-19.

§. 2. Germen oval, sessile, nearly horizontal; limb revolute; filaments inserted in the base of the segments; stigma inconspicuous. Genus Littæa? *Haworth.* Spec. Geminiflóra.

§. 3. Germen oblong-oval; perianth erect or assurgent, limb pressed against the filaments; stigma 3-lobed, lobes emarginate. Genus Agáve. Spec. Virgínica.

This genus requires to be carefully re-examined. I cannot allot the species to the three sections, but have stated the species which are their types, having had no opportunity of inspecting them.

The flowers of five species named by Zuccarini are not described. They are at present only known by the leaf.

Stemless; leaves glaucous.—1. Americána. Andr. Rep. 438.—2. Milleriána. Haworth Syn.—3. Mexicána. Haw. Sup.—4. Fláccida. Haw. Syn.—5. Brachýstachys. Red. lil. 485.—6. Spicáta. Cavan. Bibl. reg. Matr. ic. ined.—7. Yuccæfólia. Red. lil. 328. 329.—8. Virgínica. Bot. Mag. 29. 1157.—9. Potatória. potatorum. Zuccarini. 674. Scape 5-6 feet, growing the third or fourth year.—10. Heteracántha. ib. 675.—11. Macracántha. ib. 676.—12. Pugionifórmis.

ib. 676.—13. Karwinskiána. ib. 677. *Caulescent.*—14. Lúrida. Bot. Mag. 37. 1522.—15. Angustifólia. Haw. Syn. *Leaves green.*—16. Kerátto. Haw. Syn.—17. Vivípara. Comm. præl. t. 15.—18. Polyacántha. Haw. Syn.—19. Geminiflóra. Bot. Reg. 14. 1145.—20. Striáta. Zucc. 678. nearly allied to Geminiflora.

27. Doryánthes.—Bulb imperfect, long-lived; stalk capitulate, bracteate; perianth deciduous, tubed, (on the faith of Schultes and the fig. in the Bot. Mag., Brown and Sims being both silent as to the tube) funnel-shaped; segments nearly equal, reflex; filaments subulate, adnate to the base of the segments and tube; anthers long, erect, affixed at the base, which is shaped like an extinguisher; style 3-furrowed; stigma triangular; capsule turbinately ovate, 3-celled, 3-valved; seeds with a brown wrinkled foliaceous shell.

1. Excélsa. Bot. Mag. 41. 1685.

The bulbs of this plant, though imperfect, may be brought dry from Australia to Europe without injury. They seem impatient of much water. Flower tubed. Corræa Linn. Trans.

Third Division.—SCAPACEOUS.

Scape succulent, spathaceous, not articulate below the spathe.

Suborder 4. Amaryllideæ. Schistandrous, not operculate. Petaline filaments, unless equal, excelling.

† Cavæ.—*Scape hollow; seeds compressed with a black shell, capsule 3-celled, 3-valved.*

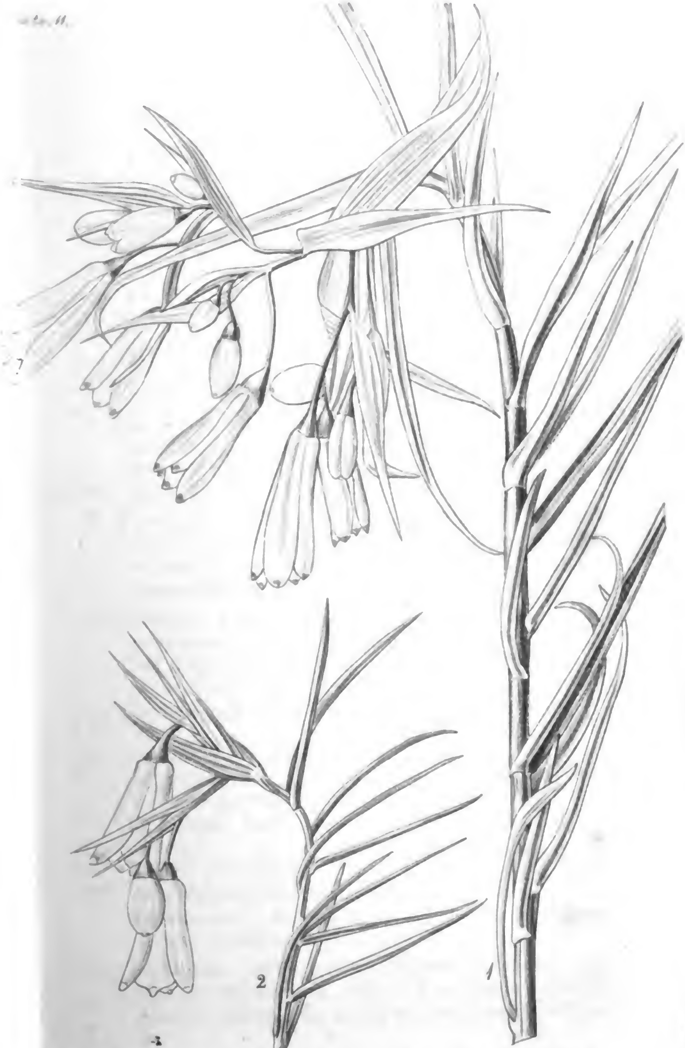
§. 1. Cyrtanthiformes.—Tube wide-mouthed; germen oval, pedunculated. *South African plants.*

28. Cyrtánthus.—Germen pendulous or declined; tube curved, narrow funnel-shaped, often a little ventricose; segments short; filaments straight, decurrent, inserted in the upper portion of the tube, the sepaline scarcely lower than the petaline; anthers attached at the upper third part, suberect; style curved downwards.

A. *With persistent leaves.*

1. Oblíquus.—Bot. Mag. 28. 1133. Flowers ten or more, pendulous, large, orange, yellow, and green; leaves an inch wide, subglaucous.

Plate 11.



W. Herbert del. *2. var. acicularis.* *1. Collania puberula.*

2. Cárneus.—Bot. Reg. 17. 1462. Flowers eight or more, pendulous, subventricose, 3 inches long, narrower than those of obliquus, pink, paler at the base; leaves blunter than those of obliquus; filaments inserted higher.

B. *With deciduous leaves. To be kept dry in winter.*

3. Pállidus.—Bot. Mag. 51. 2471. Flowers about five, pendulous, subventricose, dull pink, paler upwards; leaves dark green, about ¼ wide, acute, attenuated at both ends.—Never having possessed this plant I am not certain that it is deciduous.

4. Collínus.—Bot. Reg. 2. 162. Flowers about nine, pendulous, subventricose, poppy-scarlet; leaves 7 or 8 inches long, glaucous, above ¼ wide, subacute, attenuated below, purplish at the base.

5. Spirális.—Bot. Reg. 2. 167. Flowers about seven, pendulous, subventricose, orange-red, yellow below; style shorter than the tube; leaves spiral, glaucous, about ⅜ wide.

6. Ventricósus, Willdenow. Angustifolius, Jacq. H. Sch. 1. p. 40. t. 76. Flowers declined, orange-red, subventricose, wider than in spiralis; style much longer than the tube; leaves not spiral, green.

7. Striátus.—Bot. Mag. 52. 2534. Flowers 3 or 4, pendulous, 2½ inches long, narrow funnel-shaped, red striped with yellow; filaments shorter than the style, longer than the perianth; leaves a foot long, half an inch wide, subacute, speckled with red below.

8. Angustifólius.—Bot. Mag. 8. 271. Flowers 4 or 5, pendulous on one side, narrow funnel-shaped, orange-red; style just longer than the limb and filaments; leaves above ¼ wide, subobtuse, red below.

9. Odórus.—Bot. Reg. 6. 503. Flowers about 4, crimson, fragrant, declined, narrow funnel-shaped; filaments short; style half an inch longer; leaves linear, 1-12th wide.

10. Lutéscens.—Albo-lúteus. Burchell. Herb. 7144. Monella ochroleucra. Herb. App. lapsu. Closely allied to odorus, but in all the specimens perianth

yellowish white. Anthers almost sessile, three just within the tube, three 3-8ths of an inch below it. Native specimens 2-3-flowered. Found at the mountain station between Zwellendam and George by Dr. Burchell. I regret that by an accidental omission I have not mentioned Dr. Burchell's name amongst the gentlemen to whom I am indebted. To him I owe much for the inspection of his herbarium and drawings, as well as the kind communication of some of the bulbs he imported.

Cyrtanthus obliquus appeared to differ so much from the rest in the structure of the flower, that I was formerly induced to think it generically distinct, and adopted Mr. Salisbury's MS. name Monella for the other species then known. Soon after, I saw reason to doubt the propriety of the separation, and to believe that this genus admits greater variation of structure than most others in the same order; and that, as the filaments are decurrent, it is not essential whether the union with the tube is continued a little further or not in different species. In Vallota purpurea, of which the filaments are only adnate, there is a difference sometimes as to the point of adherence in different flowers of the same umbel. The subsequent appearance of C. Carneus with persistent leaves scarcely distinguishable from those of obliquus, and flowers more like pallidus, confirmed me in considering the plants with deciduous leaves to have been improperly detached. The diversities consist in the tube being a little ventricose in some species, the angular ribs and channels which mark that of obliquus, the more or less prolonged adhesion of the filaments to its sides, and the curved or more erect habit of the peduncle.

They are altogether plants of difficult culture, the bulbs being more disposed to dwindle and rot, than to increase in bulk. Mr. Griffin was, I think, more successful than most others in the cultivation of C. obliquus, of which he had many strong bulbs on a shelf very near the glass in his stove, where the heat was never great. A common greenhouse is usually too damp for it in winter, and the air of a hot stove too confined. A light soil which is not retentive of water will be found to suit the whole genus; and I think that the use of peat will always be dangerous to them. Those with persistent leaves should be cautiously watered in winter, the deciduous species not at all. C. Carneus is one of the most difficult to manage; twice I lost it, notwithstanding the greatest care, and have at last succeeded in establishing one with better hopes by giving it water very seldom the first year, and rather more after it had formed a strong leaf, keeping it as much as possible in a draft of air in the greenhouse. It is planted in a mixture of white sand with a little light loam, with an open under drain.

With respect to the other species there is some peculiarity in the soil congenial to them which it is very difficult to analyze. When I lived at Mitcham in Surrey, C. angustifolius was a weed with me, ripening seed freely, and the seedlings quickly came to a flowering age and were vigorous, being potted in the soil of Mitcham common, which was a light brown earth with a little admixture of dead furze leaves on a gravelly substratum. Since I have lived in Yorkshire I have been able to find no soil that suited it, and although many changes were tried, the plants dwindled and all perished: nor have I found any species of Cyrtanthus succeed well in the soils to which I have access here. Mr. Rollisson had equal success with C. angustifolius at his nursery at Tooting near Mitcham. C. lutescens has, I believe, never been in Europe, but Dr. Burchell has many specimens of it. It has very narrow leaves, and comes very near to C. odorus except in its colour, which is invariably a yellowish white. Ventricosus, figured by Jacquin under the name angustifolius, is only known to us by his plate and description. It was probably one of Masson's plants from the East coast, and is allied to Collinus. Mr. Ker conceived that Jacquin had by mistake represented a scape of spiralis with the foliage of angustifolius; but it is evident that his plant has not the inflorescence of spiralis.

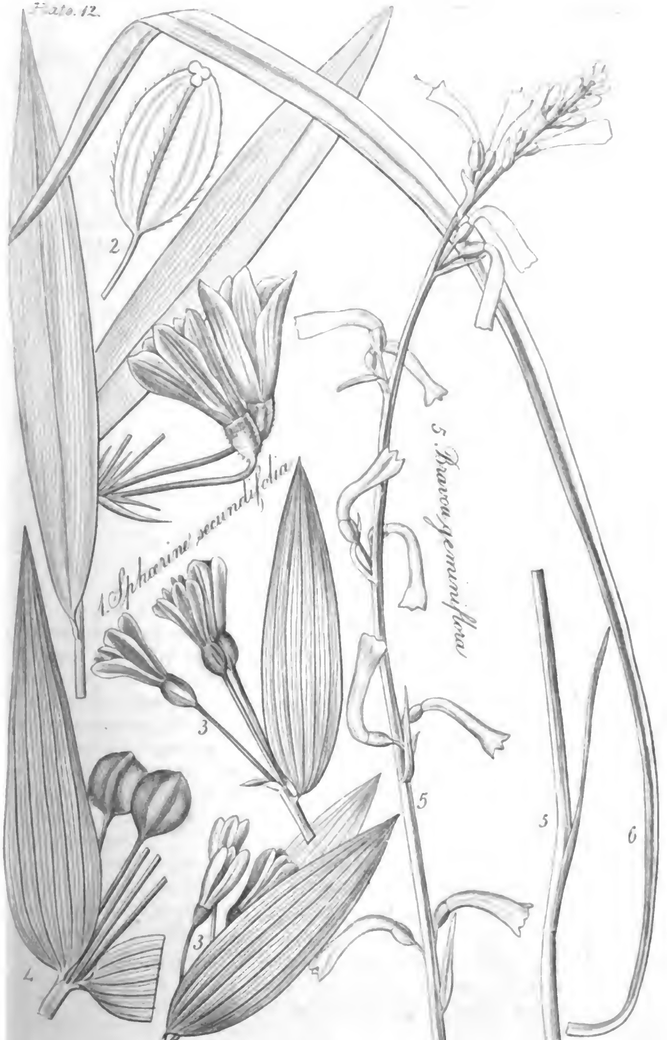
The recollection that Hippeastrum equestre, single and double, which will not exist in the light soils to which I have access in Yorkshire, throve exceedingly with me at Mitcham in Surrey, in the same soil that peculiarly suited Cyrtanthus angustifolius, and that all the Cyrtanthiform bulbs are disposed to rot in light earth at Spofforth, persuades me that wherever their cultivation is found difficult, a soil that is more disposed to set firm, and not fall to pieces when turned out of the pot, should be substituted, with good drainage and cautious watering. The difficulty is to find a light soil which has a little tenacity. There is a yellow earth of that nature in which I have observed Erica cinerea thrive with much greater vigour than in any black soil, in the neighbourhood of the New Forest, which would perhaps suit the Cyrtanthi. In a soil of that nature all Mr. Woodford's Ericæ were cultivated at Rickmansworth. The earth of Mitcham common was so congenial to the Ixias that in it I have had 72 flowers from one bulb of Ixia longiflora, and nearly as many from one of Sparaxis grandiflora, whereas the confluent soils of this neighbourhood, though favourable to the hardier Gladioli, destroy the Ixias and Babianas and are not favourable to Sparaxis.

29. Gastronéma.—Germen declined; tube below slender, curved above, wide-campanulate; limb short, reflex; filaments decurrent, conniving; three upper longer, incurved; the petaline inserted at the top, the sepaline near the middle, of the tube; anthers short; style declined, pressed against the lowest petal.

1. Clavátum.—Bot. Mag. 49. 2291. Cyrtanthus uniflorus. Bot. Reg. 2. 168. Amaryllis clavata. L'Heritier. Sert. Angl. Amaryllis pumilio. Hort. Kew. Am. tubiflora. Specim. Herb. Soc. Linn. et Herb. Banks. et MS. Bibl. Mus. Brit.—Flowers 1 or 2, white striped with red; leaves slender, attenuated below, dark green.

This very pretty little bulb, which is nearly akin to Cyrtanthus, but presents strong points of difference, appears to have been first described by L'Heritier under the name A. clavata. The name clavatum has therefore priority over pumilio and uniflorum, which last is incorrect as it often bears a two-flowered scape, of which there are three or four specimens in Dr. Burchell's herbarium, and he assures me that he found it with one or two flowers promiscuously in Africa. Mr. Ker having conceived that Amaryllis pumilio Hort. Kew. was a different plant and of a different genus, and that there existed a specimen of it in the Banksian herbarium, I have carefully inspected the Banks. herb. and MSS. with the kind assistance of Mr. Bennet, and the result is decisive that A. pumilio Hort. Kew. is G. clavatum, and the specimen marked A. pumilio in the herbarium Oporanthus luteus. In the herbarium of the Linnæan Society there is a specimen of G. clavatum marked Amaryllis tubiflora, with a reference to a MS. in the Banks. libr. In the Banks. herb. is a like specimen marked A. tubiflora by Dr. Solander,

Plate 12.


2
1. Sphaerine secundifolia
5. Bravoa geminiflora
3
4
3
5
5
6
3. distychophylla
.del.

which is erased by a line of the pen, and Amaryllis clavata added by Dryander. It is memorandumed as growing in the fields beyond *Camtours rivier*. In the MS. catalogue pumilio is also erased and clavata substituted by Dryander. A. pumilio was the name given to this plant in the Hort. Kew. when it had been ascertained that it was not the tubiflora of L'Heritier; and when Dryander afterwards perceived its identity with A. clavata of L'Heritier, the right name was substituted. Whether the description in the Hort. Kew. be correct or not, these entries are decisive as to their identity, and Southern Africa has not produced any other one-flowered plant of this suborder, except gethyllis. In plate 21. fig. 2. I have given an exact outline of the specimen in the Banks. herb. marked *Amaryllis pumilio Hort. Kew.* It is a garden specimen from Kew, which seems to have been shrivelled before it was laid in, and is much damaged; with it there is a fragment of a leaf reversed, with *top* and *bottom* written by Dryander. There is no entry concerning this specimen in any of the MS. books. Fig. 3. I have placed beside it an exact outline of a flower of Oporanthus luteus better preserved, and it will be apparent to the most unpractised eye that they are specimens of the same species. Whether the erroneous description of A. pumilio in the Hort. Kew. be from the pen of the younger Linnæus, as cited by Mr. Ker, or (as I have been told) from that of Dr. Solander, it is needless to inquire; it will be evident to any person who will examine and compare it with G. clavatum and the specimen marked A. pumilio in the Banks. Herb. of which I have given an outline, that the description is an amalgamation of the two, probably in consequence of an attempt to reconcile the description first made from G. clavatum with the garden specimen of Oporanthus, erroneously laid in under name of A. pumilio, and so confounded with it. At all events Amaryllis pumilio must be expunged as a non-entity.

G. clavatum requires to be kept dry in the winter. Dr. Burchell's bulbs flowered well in his garden border, having been set there in the spring, but they all perished afterwards.

30. Vallóta.—Germen erect; tube straight, wide; limb funnel-shaped; filaments conniving, adhering by one side only to the tube (the petaline to the summit of the tube or even to the petals, the sepaline lower;)

anthers affixed at one-third from the bottom, or rather nearer to the middle, suberect; style declined.

1. Purpúrea.—Amaryllis purpurea. Bot. Mag. 35. 1430. Am. elata. Jacq. H. Sch. 1. 32. t. 62. Am. Speciosa. L'Herit. S. Aug. 12.

Var. 2. Minor.—Am. purpurea. Bot. Reg. 7. 552. Flowers smaller and paler.

This beautiful plant is so closely allied to Cyrtanthus, that I have even entertained doubts of its being distinct, and should wish to see it ascertained by further experiments whether it is incapable of mingling with that genus. Those who confound it with Hippeastrum are quite in error. So ill are the affinities of plants in this order understood, that I observe some Botanists persist in uniting it with Amaryllis, from which it is widely removed. Dr. Burchell told me that it was the only bulb of the order that he had found growing in boggy peat in Africa. It delights so much in wet, that it will thrive even in water. Its decayed coats are, however, so very retentive of moisture, and impenetrable to the air, that the plant does not flourish in the stove or greenhouse, unless they are pulled off if the bulb be above ground: and, although it is very thirsty, the bulbs are often lost by rottenness, and are very apt to decay on the voyage from the Cape. I think in a pot it succeeds better in loam or loam and peat mixed than when planted entirely in peat. It must be kept always growing, and shows no dislike to the stove in winter. All Cyrtanthiform pollen is small.

§. 2. HIPPEASTRIFORMES.—Germen triangular, wider above, constricted in the middle. Tube narrow-mouthed. Capsule 3-celled, 3-furrowed, 3-valved. *Occidental plants.*

31. SPREKÉLIA.—Jacobean lily. Perianth declined, tube scarcely any, upper segments reflex, lower sloped downwards, convolute at the base; filaments inserted equally with a connecting membrane at the base of the perianth, fasciculate, declined and recurved as the style; the upper sepaline and lower petaline shorter than the others. Anthers pendulous, affixed one-third from the top.

1. Formosíssima.—Amaryllis formosissima. Bot. Mag. 2. 47.

I cannot find that we had any knowledge of the precise natural habitation of this splendid flower; but Mr. Bateman has just communicated to me bulbs collected by Mr. Skinner in Guatimalà, which prove to be this plant.

The bulbs are perfectly hardy and appear to like a low temperature, but they will not flower willingly unless they have a season of drought. They succeed well against the wall of a stove in the open ground, flowering in the spring and sometimes again in the autumn, if the summer has been very dry. They rarely blossom if watered through the winter in a greenhouse, but if kept dry and warm for a few months, they will flower as soon as they are watered in the spring. I have twice known this plant produce a two-flowered scape accidentally, but it is usually one-flowered. No instance has come to my knowledge of its bearing seed in this country. Its ovules are longer than those of Hippeastrum, and the particles of its pollen longer, blunter, and often bent. See plate 34. fig. 32. The pollen is very abundant and perfect, but its semination seems to depend upon some very nice adaptation of temperature and moisture. Numberless unsuccessful attempts have been made to cross it with other genera, especially Hippeastrum and Zephyranthes. It likes a fertile soil, and the bulbs may be advantageously planted out in spring, and taken up and dried on the approach of winter.

32. **Hippeástrum.**—Perianth declined, tubed; tube abbreviated underneath; faucial membrane, when manifested, defective on the lower side (not annular as in Habranthus), the upper sepal wider, the lower petal narrower; filaments declined, recurved, inserted in the tube with gradations, the upper sepaline longer and inserted higher, the lower petaline shorter and inserted lower; style declined, recurved; stigma trifid or triangular.

Calyptratæ.—Tube screened.

1. Aúlicum.—Am. aulica. Bot. Reg. 6. 444. Flowers two, crimson, with a green fleshy screen at the mouth of the tube; sepals narrower than the petals; lowest petal outstretched, embracing the filaments.

Var. 2. Platypétalum.—Am. aulica var. Bot. Reg. 12.

1038. Limb wider, fleshy screen less conspicuous, green star larger.

Var. 3. Glaucophýllum.—Am. aulica var. Bot. Mag. 57. 2983. Sepals nearly as wide as the petals, green star longer, screen nearly obsolete.

2. Calyptrátum.—Am. calyptrata. Bot. Reg. 2. 164. Flowers two, green, with faint red tesserated marks; sepals narrower than the petals; screen conspicuous.

3. Psittacínum.—Am. psittacina. Bot. Reg. 3. 199. Flowers two, green, beautifully streaked and margined with bright red, sepals widest; screen conspicuous; upper petal depressed.

Læves vel barbatæ.—Tube smooth or bearded.

4. Solandriflórum.—Lindley Coll. Bot. t. 11. var. chloroleucum. Flower green and yellowish white, eight inches long, tube smooth; style nearly as long as the perianth; filaments a little shorter.

Var. Striátum.—Bot. Mag. 52. 2573. Flower from nine to ten inches long, faintly striped without with red; tube from 3 to 4½ inches long.

Var. Rubrítuba.—Ib. absque icone. Flower greenish white, tube purplish red.

Var. Conspícuum.—Var. β. vittata. Bot. Reg. 11. 876. Flower ten inches and a half long, faintly striped outside with red, tube purplish red.

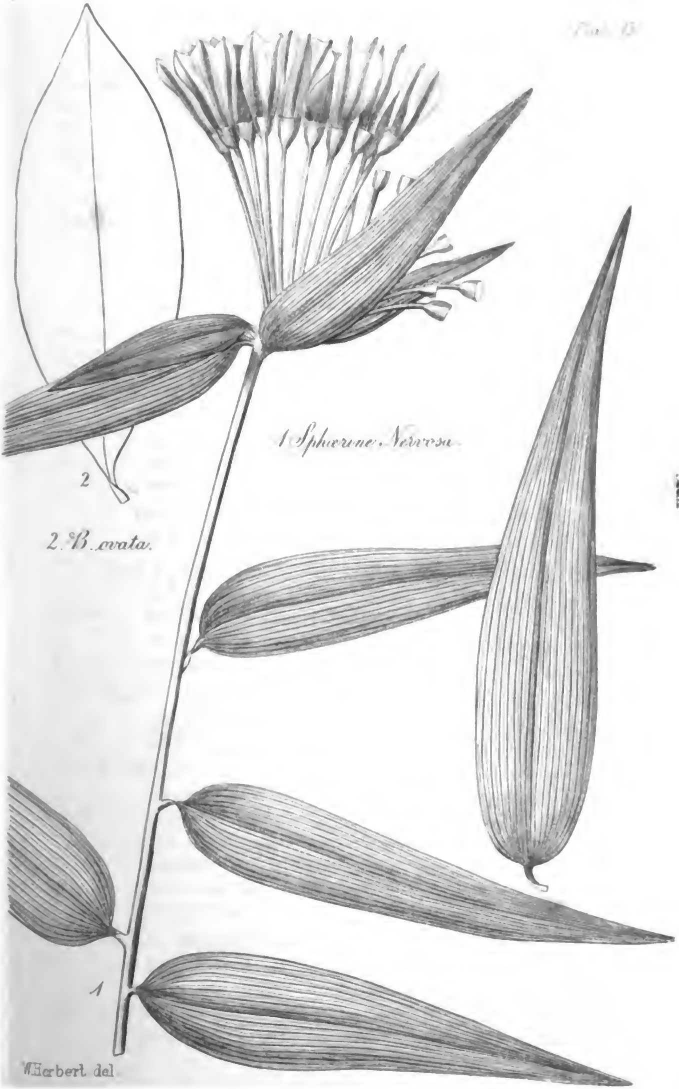
5. Ambíguum.—Per. tubuloso, segmentis intus rubro-striatis fauce leviter barbatâ, stylo filamenta superante, perianthium subæquante.

Var. 1. Longiflórum.—Bot. Mag. ined. 62. 3542. perianthio 8 unciali. Ex Limâ Peruviæ allatum.

Var. 2. Tweediánum.—Pl. 21. f. 3. perianthio sub-6-unciali. Specim. Herb. Hooker. Ex Braziliâ meridionali? Tweedie.

The first variety with the flower eight inches long, white with red stripes within and slightly bearded, was sent from Lima to the Glasgow Botanic Garden, where several of the bulbs flowered; and singularly resembled a cross-bred plant

Tab. 13



1 Sphaerine Nervosa.

2. B. ovata.

W.Herbert del.

at Spofforth, raised from a complicated intermixture of Regium, vittatum, and solandriflorum. The second, only known by Tweedie's specimen, has a shorter flower, but in other respects very similar. Flower five inches and $\frac{3}{4}$ long, white, with two deep purple stripes, with a white stripe between, on each segment; segments acuminate; tube only one inch and $\frac{5}{8}$ long; style nearly equal to the perianth, an inch longer than the stamens; stigma trifid.

6. Breviflórum.—Pl. 21. f. 4. Bot. Mag. ined. 62. 3549. Specim. Herb. Hooker (ex Braz. meridionali?) Tweedie. Peduncles about $2\frac{1}{2}$ inches, tube $\frac{1}{4}$ of an inch long, limb two inches, white, striped outside with red, and stained with yellow; style $\frac{1}{2}$ an inch longer than the stamens, $\frac{1}{4}$ shorter than the limb; stigma trifid, reflex; lateral sepals about $\frac{5}{8}$ wide, lateral petals nearly equal to them. Sent by Tweedie to the Glasgow Botanic Garden, where it has flowered.

7. Vittátum.—Am. Vittata. Bot. Mag. 4. 129. Flowers 4 to 9, white doubly striped with dull red.

Var. 2. Latifólium.—v. major. Lindl. Coll. Bot. 12. Larger, with broader and more glossy leaves; perianth five and a half inches long, broad dull red stripe with green star; style five inches long, filaments a little shorter.

Var. 3. Harrisoniánum.—Bot. Reg. 12. 988. Tube greenish, limb obtuse, doubly striped with red within; said to grow near Lima.

8. Reticulátum.—Am. reticulata. Bot. Mag. 18. 657. Flower purplish red, beautifully reticulated with a deeper colour; star white. Style nearly as long as the limb; pollen very pale; stigma triangular, obtuse; leaves very deep green, attenuated below: inside of the ripe capsule red; seeds fewer and less compressed than usual in the genus.

Var. 2. Striatifólium.—Amaryllis. Bot. Mag. 47. 2113. Bot. Reg. 5. 352. Flower larger, paler; leaf with a strong broad longitudinal white line; capsule and seeds as in the prototype. Some imported individuals have the flower small and darker as in the green-leaved plant. Am. principis de Salm Dyk *Schultes* is evidently this plant.

9. Barbátum.—Pl. 21. fig. 1. Crinum barbatum. Linn. MS. cum spec. ex Surinam in Herb. Linn. Soc. flore albo, stellâ viridi, tubo viridi barbato. Amaryllis. dubia. Linn. Amœn. 8. 254. with reference to the figure of H. equestre, misnamed Belladonna, Merian Surinam. t. 22. Tube ¾ of an inch, slender, green, bearded; limb about 2½, white with a green star; upper petals 1 and 3-16ths wide, lower 1 and 1-16th; lower sepals 13-16ths wide; leaf sub-obtuse, attenuated at both ends, a little undulated, margin whitish and recurved; greatest width 1 and 3-16ths. Flowers three or more. *Grows near Surinam.*

10. Equéstre.—1. minus. Am. equestris. Bot. Mag. 9. 305. Merian Surinam. t. 22. Flower bright orange, with a green star; tube cernuous, fimbriated at the mouth; upper segments very reflex, lower protruded; stigma with short round lobes. *Surinam, Trinidad, West Indies.*

Var. 2. Majus.—Amaryllis. Bot. Reg. 3. 234. With much larger flowers, and longer more erect leaves. *Demerara.*

Var. 3. Semi-plenum. — Pulcherrima hortulanorum. Leaves like the prototype; flowers semidouble, found by Fraser in Cuba near the Havannah: imported also from Bahama.

11. Stylósum.—Bot. Mag. 49. 2278. ic. nimis obscur. Am. Maranensis. Bot. Reg. 9. 719. Flowers of a dull coppery flesh colour, with a short cernuous greenish tube, fimbriated; filaments more than half an inch, style more than an inch longer than the perianth; leaves much more glossy than those of equestre. *Grows near Maranham.*

I never saw a specimen with the filaments so much prolonged as in the fig. in the Bot. Reg. and I doubt its correctness in that point. The name Stylosum has priority over Maranense, which Schultes has wrongfully preferred.

12. Miniàtum.—Flor. Peruv. 3. 57. without a figure. Flowers three or four, cernuous; tube three lines long, with six fimbriated white scales at the mouth;

sepals obtuse, wider than the petals, upper one reflex; lowest petal narrow; style and filaments equal to the perianth; stigma triangularly three-lobed. *Peru.* It seems to form a link between Equestre and Regium. A. Chilensis (Ruiz) is not distinguishable from this.

13. Régium.—Amaryllis reginæ. Bot. Mag. 13. 453. Flowers scarlet with a green star, cernuous, much more funnel-shaped than those of equestre; segments more equal; upper sepal not so reflex; tube much thicker and shorter; scape shorter. Named from having flowered first in England on the queen's birthday, in 1728. Said to be from Mexico; seemingly native of a hotter climate; perhaps from the neighbourhood of Vera Cruz. A bulb of Skinner's from Guatimalà looks like it.

14. Glaucéscens.—Martius apud Schultes. (Without a figure.) Differs from Bulbuliferum, var. fulgidum, in having glaucous leaves, and the upper sepal non-revolute; from var. acuminatum in having the segments less acuminatum, and scarcely undulated; from Bulbuliferum generally, in having the mouth of the tube scaly or bearded; and as it is a native of the banks of Rio des Contes in the hot province of Bahia, I doubt its being one of the bulbuliferous family. It is known only by Dr. Martius's description. It is probably a variety of the Maranham stylosum. It has the tube short and thick.

15. Bulbulósum.—This species inhabits the middle latitudes of Brazil, where it branches into a vast number of local varieties, some of which have been described as separate species; but they all agree in producing blind offsets round the bulb (some of which have been known to lie dormant for years refusing to vegetate), in having orange-coloured flowers of various tints, with the upper sepal more or less recurved, and a cernuous tube of which the mouth is either smooth, or only shewing a very slight disposition to become bearded, and the leaves arcuate.

Var. 1. Subbarbátum.—Bot. Mag. 51. 2475. Flowers highly coloured, sepals much wider, lower petal very narrow, tube red with a little vestige of beard; leaves 2 to 2½ inches wide.

Var. 2. Unguiculátum.—Martius ap. Schultes. Without a figure. Stated to approach closely to subbarbatum, differing in a less cernuous tube with a thin membrane between the filaments; the upper sepal to be less reflex than in fulgidum. The leaves agree with those of subbarbatum. It grows in the glens of Mount Corcovado, and on the hills near St. Sebastian's in Brazil.

Var. 3. Rútilum.—Am. rutila. Bot. Reg. 1. 28. Flowers brilliant, tending to scarlet, smaller, tube about half an inch long, with a minute knob at the mouth; leaves under an inch wide.

Var. 4. Fúlgidum.—Am. fulgida. Bot. Reg. 3. 226. Flowers larger, paler, tube about an inch long, throat quite smooth.

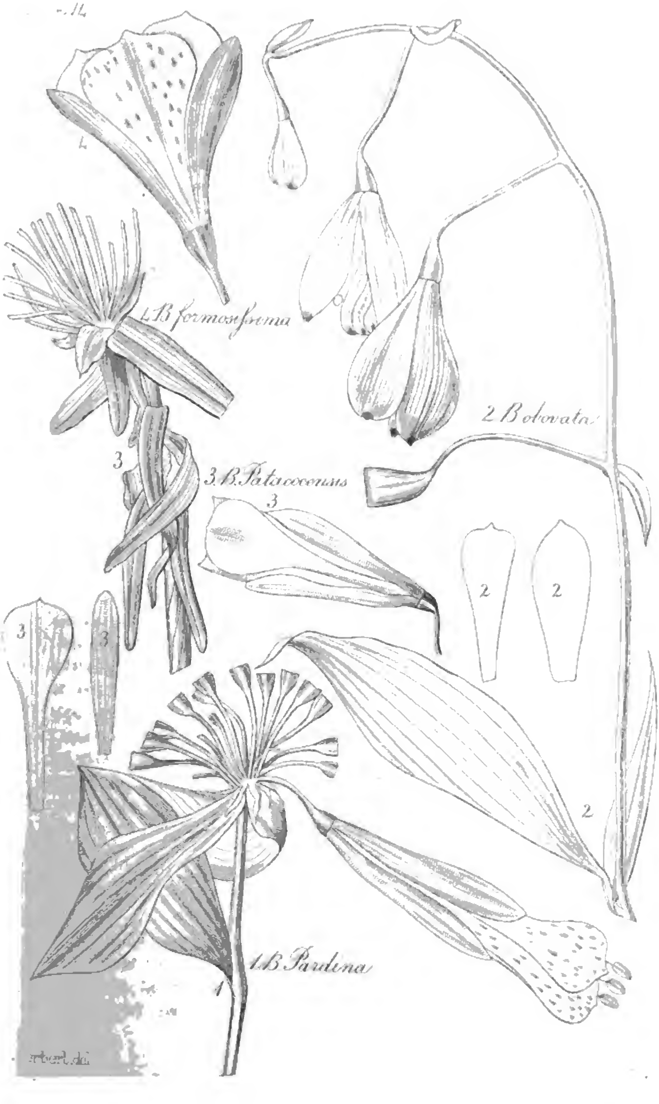
Var. 5. Pállidum.—Like the former, but the flower smaller and much paler. Imported some years ago by Mr. Tate.

Var. 6. Simsiánum.—Am. miniata. Bot. Mag. 45. 1943. Flower red lead colour, tube short, smooth at the mouth; leaves growing near the ground, arcuate. Certainly not the A. miniata of Ruiz and Pavon; but so closely allied to Fulgidum, as to leave no doubt in my mind that it came from Brazil originally, though said vaguely to have been from the West Indies.

Var. 7. Equestrifórme.—Flower very similar in structure to equestre minus, but the mouth of the tube smooth, the leaves and bulb like Fulgidum. Sent growing in the midst of some epiphytes unperceived by my collector from the neighbourhood of Rio.

Var. 8. Acuminátum.—Am. acuminata. Bot. Reg. 7. 534. and 14. 1188. Flowers pale, undulate, acuminate, tube smooth; leaves with a glaucous bloom.

Var. 9. Pulverulentum.—Bot. Mag. 49. 2273. Flowers darker, less acuminate; leaves with a glaucous bloom. Both the varieties acuminatum and pulverulentum grow naturally near Rio, where my


14
4
4.B formosissima
2.B obovata
3
3.B Pataocensis
3
2
2
3
3
2
1.B Pardina
1
rbert.del.

collector found them growing in black vegetable earth, with a scape above three feet high. I cannot distinguish the var. longipedunculata, 1188, from acuminata, 534, Bot. Reg. In the latter the shortness of the peduncles is an error of the artist. I think there must be a mistake in the account that longipedunculata was found in a wild state near San Pablo Quatro-Venados in the State of Mexican Oaxaca. It seems very improbable that this variable genus should manifest itself exactly in the same form in two spots 40 degrees asunder, in the North and South hemispheres. It is, however, possible. I believe the bulbs of pulverulentum from Buenos Ayres to be garden productions.

Var. 10. Ignéscens.—Scape and leaves more robust than fulgidum, dark green, flowers smaller, more undulated and crowded, fiery orange, approaching more to Crocatum in form.

Var. 11. Crocátum.—Amaryllis. Bot. Reg. 1. 38. Scape and leaves robust, flowers smaller and more undulated than fulgidum, upper sepal less reflex. The flowers of this plant are very subject to the distemper called the curl.

H. Spathaceum, hybridum, Bot. Mag. 49. 2315. is Rutilo-Johnsoni, a cross-bred seedling of the same race as that figured under the name Splendens, Herb. App.—Am. Braziliensis, Red. Lil. 8. 469. is the English mule Johnsoni or Regio-vittatum. All other named varieties belonging to this genus are cross-bred intermixtures, which are almost interminable; for all the species appear to breed freely together; and their produce is fertile and easily crossed again. The system of giving a Latin specific name to every cross-bred seedling, which prevails amongst cultivators, and has been unfortunately sanctioned to a certain degree by M. De Candolle, and completely adopted by Sweet in his Hort. Brit., where he has overwhelmed the natural species of this genus by the association of one or two hundred cross-bred seedlings, bearing names of the like description with those of the original species, is very objectionable; and it is high time that the writers of all botanical works should set their faces decidedly against it. I will enumerate the principal crosses which have been effected in this genus, retaining

Sweet's appellation, where he has used the genitive of a personal name, but rejecting the Latin adjectives which ought to be reserved for the natural species, and I have given such names in their place as will exemplify the nomenclature I propose for such demi-species. It will be recollected that I have recommended the change of the few genitives of proper names which occur amongst the species into an adjective termination, for the purpose of confining the genitives to the plants of mixed origin. I consider the two converse productions obtained by reversing the sexes of the parents to be included under one name, covering all the crosses raised from different varieties of the same two species; for instance that the mixture between Vittatum and any variety of Bulbulosum should bear the same name, and its diversities only rank as subordinate varieties. Even with that limitation the artificial demi-species will be very numerous, but florist's names, such as Juno, Ceres, Camillus, Napoleon, Alompra, Sigismunda, &c., must be given to the subordinary varieties, and those deserve no place in a botanical arrangement, belonging properly to the catalogues of cultivators. I think it will be much best to limit the names of cross-bred demi-species strictly to genitives of proper names or of the place where they were raised. In the descriptive double name, that which is placed first indicates the male, but the converse is intended to be included under it.

Hybrid or mixed Crosses.—1. *Johnsoni*, or Regio-vittatum; raised by Johnson, who had a small garden in Lancashire, in 1810; by me at Mitcham, in 1811, and at Highclere later. Am. Braziliensis, Red. Lil. 8. 469. Am. Carnarvoni. De Candolle. improperly, since the name Johnsoni had been previously published in the Hort. Trans. and was in general use. Johnson's cross was probably accidental, for he thought it a mule between Vittatum and Sprekelia formosissima, and it passed for such during several years.—2. *Seymouri*, or Aulico-vittatum, named from my present gardener.—3. *Allmanni*, or Calyptrato-vittatum; raised at Colvill's where I saw it in flower; named from the Professor of Botany at Dublin.—4. *Andersoni*, or Bulbuloso-vittatum; named from the conductor of the Chelsea garden; very variable, according to the variety of bulbulosum from which it is raised.—5. *Hookeri*, or Goweni-vittatum; very beautiful; named from the Botanical Professor at Glasgow.

—6. *Grahami*, or Johnsoni-vittatum; approximating to vittatum, but with larger and more brilliant flowers and tenderer constitution; named from the Botanical Professor at Edinburgh.—7. *Digweedi*, or Striatifolio-vittatum; named from the foreman in the Highclere garden.—8. *Griffini*, or Psittacino-Johnsoni; very beautiful and variable in its colour, but always distinguishable from Psittacinum by the upper segment not being depressed; the only mule raised by Mr. Griffin.—9. *Sweetii*, or Reticulato-Johnsoni, including the crosses from Striatifolium; raised first by Sweet at Colvill's Nursery. I have a seedling from one of the Striatifolio-mules, which so closely resembles in foliage and flower the original reticulatum that it might be mistaken for it.—10. *Brookesi*, or Bulbuloso-Johnsoni. The cross by the variety Crocatum was first raised at Brookes's nursery; that by rutilum at Highclere; by fulgidum at Spofforth.—11. *Benthami*, or Styloso-Johnsoni; named from Mr. Bentham, whose botanical labours are well known; raised at Spofforth; flowers of a gloomy but variable colour.—12. *Daubenii*, or Griffini-Johnsoni; a very beautiful cross raised at Spofforth; named from the Botanical Professor at Oxford.—13. *Carnarvoni*, or Solandrifloro-Johnsoni; a magnificent cross raised at Highclere and at Spofforth; named from my lamented brother in lieu of regio-vittatum to which Mr. De Candolle had applied the name inadvertently.—14. *Altaclaræ*, or Psittacino-Griffini; named from Highclere, where it was raised.—15. *Haylocki*, or Solandrifloro-bulbulosum; raised at Spofforth, and named by Sweet from my deceased gardener.—16. *Herberti*, or Solandrifloro-stylosum; raised at Spofforth, and named by Sweet. I have one of this cross with a pale orange flower, the largest I have seen in the genus, though that of stylosum is small.—17. *Harrisoni*, or Reticulato-stylosum; raised by R. Harrison, Esq.—18. *Parkeri*, or Bulbuloso-reticulatum; named from the foreman at Spofforth.—19. *Hoodii*, or Equestri-regium; raised at Colvill's; unknown to me; named by Sweet.—20. *Henslowi*, or regio-bulbulosum; raised at Spofforth; very brilliant; named from the Botanical Professor at Cambridge.—21. *Batemanni*, or Equestri-bulbulosum; raised at Colvill's, named from J. Bateman, Esq.—22. *Goweni*, or Reticulato-bulbulosum; raised at Highclere from pulverulentum; very beautiful; named from R. J. Gowen, Esq.—23. *Munroi*, or Psittacino-equestre; raised at Colvill's; unknown to me; named after the gardener of the Horticultural Society.—24. *Baconi*, or Psittacino-regium, ib. named from my deceased friend Ant. Bacon, Esq., a zealous cultivator of plants of this order.—25. *Colvillii*, or Reticulato-regium; raised at Colvill's.—26. *Cartoni*, or Aulico-Sweetii; named from Carton the gardener at Highclere, when it was raised there.—27. *Lindseyi*, or Aulico-reticulatum; named from the present gardener at Highclere where it was raised.—28. *Lamberti*, or Cartoni-Grahami; raised at Spofforth; named from A. B. Lambert, Esq.—29. *Donnii*, or Hookeri-Haylocki, a complicated cross, raised at Spofforth, in most of which the stripe of striatifolium has descended from the first cross; named from the Botanical Professor of King's College.—30. *Spofforthiæ*, or Aulico-Carnarvoni; named from Spofforth; not yet blown.—31. *Lindleyi*, or Griffini-Carnarvoni; raised at Spofforth; named from the Botanical Professor of the London University.

Many years ago, when, in a letter published in the Hort. Soc. trans. I first distinguished this genus from the plants with which it had been confounded, I retained for it the name Amaryllis, and proposed that of Coburghia for Belladonna and Blanda. I was not then aware that Linnæus had given the name Amaryllis to Belladonna, with a playful reason assigned; but as soon as I learnt it, I felt, besides the general law of priority, that the *jeu d'esprit* of a distinguished man ought not to be superseded, and that no continental botanist would submit to the change. I therefore restored the name Amaryllis to Belladonna, and gave that of Hippeastrum or Equestrian star to this genus, following up the idea of Linnæus when he named one of the original species equestre. Mr. Sweet has improperly given the name Amaryllis to these bulbs, and made Belladonna a generic name, to which he subjoined a new specific one. This was doubly wrong, for with his view he ought to have adopted the proposed name Coburghia, which has been since applied to another genus. The first institution of the genus Amaryllis was by Linnæus in Hort. Cliffort. p. 135, published in 1737. The name was given expressly to supersede Tournefort's Lilio-narcissus, which he rejected as a compound word. It so happens that the few species enumerated there by Linnæus are of different genera, as Sprekelia, Zephyranthes, Nerine and Oporanthus; and it was meant to comprise every thing called Lilio-narcissus by Tournefort: but he says that he gives the title in allusion to the name Belladonna, by which several species were

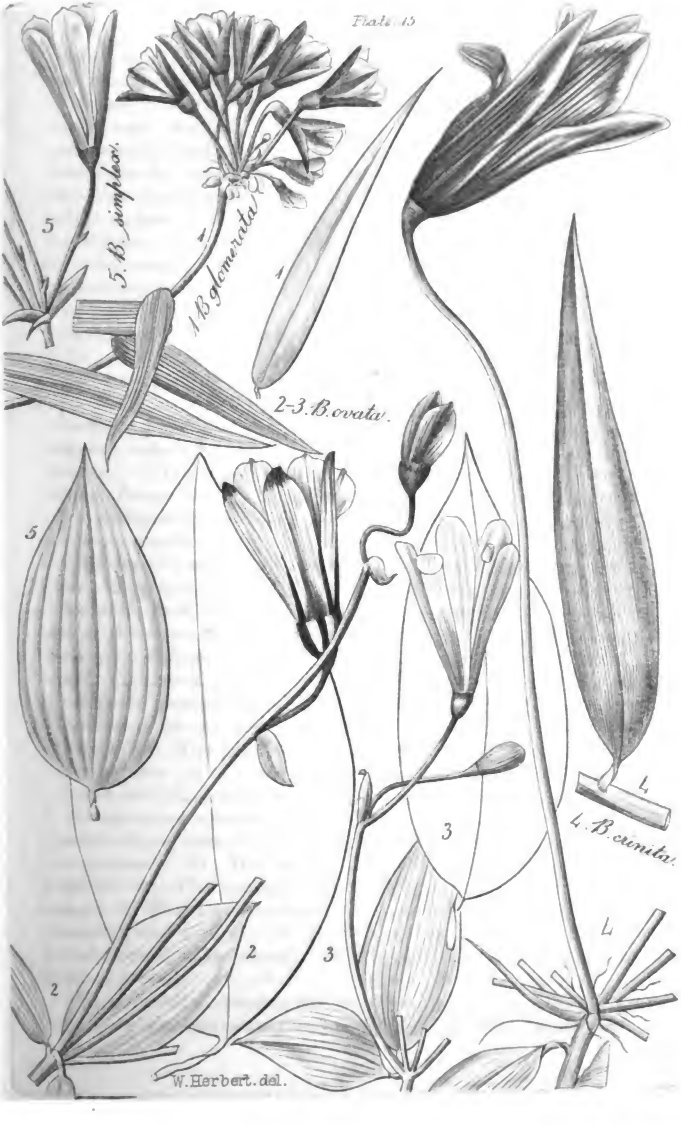


Plate 15
5. B. simplex.
1 B. glomerata
2-3. B. ovata.
4. B. crinita.
1
2
2
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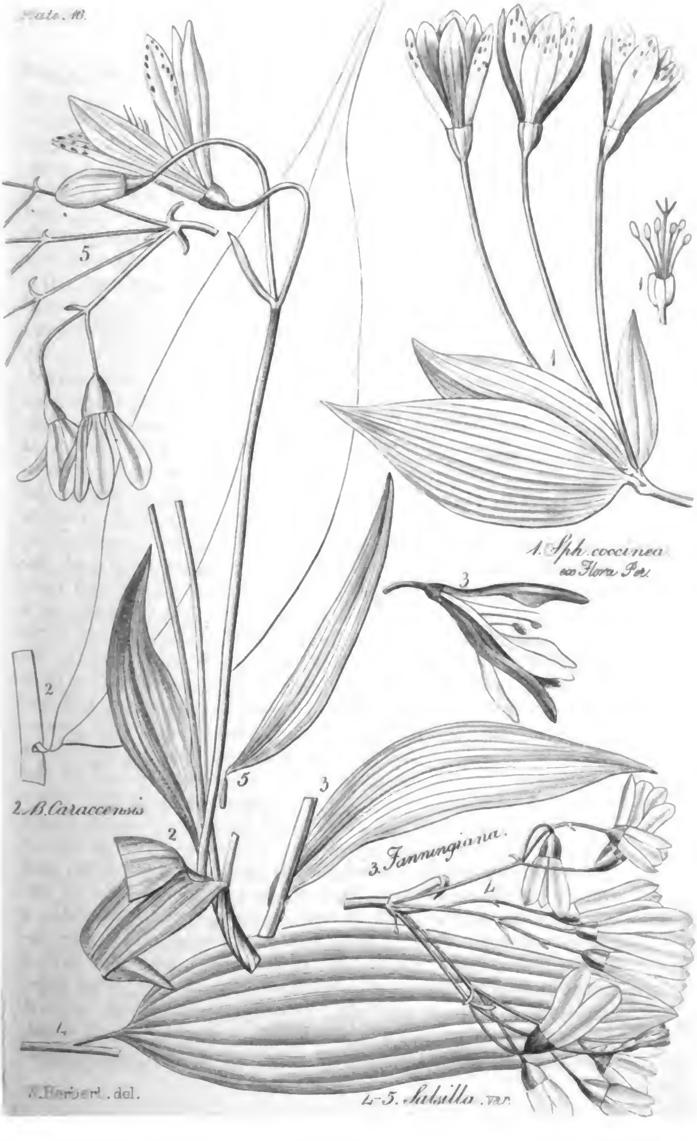
5
5
W. Herbert. del.

known, because Amaryllis was the bella donna of Virgil, and her name was become proverbial for loveliness; and he adds a further conceit, that some of the bulbs were said to be bitter, *amarellas*. Amaryllis belladonna is not one of the few species defined in that article, because, though he knew of its existence, he had it not to enumerate from the Clifford garden. Mr. Sweet was perhaps misled by knowing that equestre, which is one of the plants described, was called belladonna by Merian; but Merian only called it *another belladonna*, with reference to the plant of the Italian gardens, thinking erroneously that it was of the same genus. Barrelius had previously, in the year 1714, described the pink and white belladonna, as cultivated by that name in the gardens of Italy, and to the plant of Barrelius both Merian and Linnæus alluded. It was the exquisite blending of pink and white in that flower, as in the female complexion, that suggested the common name in Italy, and to those lovely tints Linnæus referred, when he assigned to it the name of a beautiful woman. To suppose he could have alluded to a bright orange flower would be perfectly absurd. It is, therefore, quite indisputable that Belladonna is the type of the Linnæan genus Amaryllis, and it would be an idle insult to the memory of Linnæus to remove it without any cause. It is equally clear, that this genus Hippeastrum is quite distinct from Amaryllis, and, as belonging to a different section of the order, it has no proximate affinity to it. It is divided from Amaryllis Belladonna by the following features. 1. Hollow scape. 2. Black shelly seeds. 3. The seeds not bursting the capsule prematurely. 4. The oblique mouth of the tube abbreviated on the under side by the deeper incision of the perianth. 5. The fourfold instead of alternate diversity of the segments. 6. The fourfold instead of alternate insertion, (7.) the fourfold instead of alternate length, of the filaments. 8. The nectareous beard or screen in several species. 9. The germen sloped from the peduncle. 10. The tube sloped from the germen. 11. The constriction of the germen in the middle. 12. The capsule widest instead of narrowest at its base. 13. The flower accompanying or following instead of preceding the leaves. 14. The growth of the leaves being vernal instead of autumnal. 15. The plants Occidental instead of African.

An idea was adopted by Mr. Ker, that Amaryllideæ sometimes bore one sort of seed and sometimes another. In 1821

I stated that after many years attention to their cultivation, I had never seen the slightest variation, and that it would not seem more improbable to me that a fowl should sometimes lay a duck's egg, or gooseberry bushes produce peaches, which I fear was too lightly expressed, and may have given unintentional offence. After fifteen years additional experience and constant attention to this natural order, I can reassert that I have seen no such variability, and that the notion that Crinum Capense sometimes bore flat black shelly seeds was certainly founded on erroneous information. The seed of Hippeastrum has an outer black foliaceous separable integument, which after the decay of the seed will lie under ground for years without perishing. It has an inner brown coat adhering more closely to the almond-like albumen in which the embryo lies with the point directed to the orifice. Seeds of Crinum and Amaryllis, which Mr. Salisbury used to call albuminous, very improperly, since they seem to contain no real albumen, have the outer coat soft and inseparable from a fleshy mass which is the middle or fleshy coat (in Hippeastrum quite dried up and obsolete), and the inner coat is not separable from it; within lies the embryo, usually (I believe always) without any albuminous bed. I have opened hundreds of Crinum and Hymenocallis seeds without discovering any, but I have not had the same frequent opportunities of cutting through those of Amaryllis. There is no instance in the order of such fleshy seeds being produced by a plant with a hollow scape. I was deceived, when I published the appendix, by a little diversity in the seed of Hippeastrum reticulatum and the variety Striatifolium, to believe that they constituted a separate genus. The contrary was soon proved by their producing fertile crosses with the other species, and I have them now blended with Aulicum, regio-vittatum, pulverulentum, &c. and breeding again freely with any species or variety. On re-examination of the seed it appeared that there was no substantial difference, but that the seeds of reticulatum are few, and therefore rounder and not flattened by compression; the inside of its capsule is remarkable by its orange colour, but this disappears in the first cross, as well as the roundness of the seeds, while the white stripe of striatifolium endures through many successive alliances. My attention having been kindly called to the difference between the seed of Iris fœtida and other species, with a view to the soundness of the principle on which I build, that plants of the same genus cannot have seeds of different structure, I have compared them attentively with those of spuria and ochroleuca, and I find no real difference of structure, though much of appearance. Those of Iris fœtida are plump and of a bright orange; those of the two others are rather shrivelled and dark brown. The outer coat of the two latter is separable, thin, and pellucid; the flesh coat pulpy, and gradually drying up, in consequence of which the outer coat becomes shrivelled; the inner or third coat separable from the albumen in the interior. The outer coat of the seed of fœtida is equally separable but orange (being exactly the same difference as between the pericarp of Hæmanthus hyalocarpus and coccineus), and the second or fleshy coat is more full, consistent, and durable; but I perceive no difference of structure. It is a case somewhat analogous to that of H. reticulatum. Another section of the genus Iris has the outer and inner coats thicker and a cavity between them, the pulpy coat being quite obsolete. It is not requisite that I should give any opinion here as to the generic identity of these plants, nor have I sufficiently investigated it. It is certainly possible, where there is a pulpy coat that dries up sooner in one species than in another, that it may be entirely absorbed at an earlier period in a third, thereby thickening the other coats and leaving a cavity between them, without any original difference of structure: but wherever we find any difference of seed corresponding invariably with a difference in the structure of the flower, I think we may with tolerable confidence pronounce the plants to be of distinct genera, and incapable of breeding together.

There is some difference as to the cultivation of the various species of Hippeastrum, in consequence of the several latitudes, altitudes, and situations in which they are found. Capricious watering is their bane; they should be watered pretty freely while they are making leaves, more sparingly after they are grown, and not at all when at rest. Aulicum I have found very difficult to manage; I have had but two or three roots of it, and have not been satisfied with their treatment. Calyptratum flourished well with me in light soil on the hothouse flue, growing all the year round, till I was told by a gentleman that they had been found to succeed better in the greenhouse, and having transferred them, according to his advice, I lost all my bulbs of that species. Psittacinum and the beautiful mules between it and Regio-vittatum are hardy greenhouse plants, requiring absolute rest in the winter, and flower freely in the spring; they grow weak in the stove, and will not flower without rest. Solandriflorum and Stylosum are tender stove plants, but should rest in winter time. Vittatum is a greenhouse plant requiring rest in winter, and may be brought into the stove in spring to flower it. In Surrey it lived well, flowered yearly, and sometimes ripened seed, in the open ground near the south front of my house, a small heap of ashes being thrown over it in the winter. The mules between Psittacinum and vittatum would perhaps bear as much exposure, if the wet could be kept from them in winter. Reticulatum and striatifolium are tender stove plants, and I believe the former is nearly lost, and its habitation has never been exactly ascertained. Of latter years the striped-leaved variety has been frequently sent from Brazil, but the original plant has not been met with. The mules between striatifolium, and different varieties of bulbulosum, as well as regium and regio-vittatum, have a hardier constitution, and many of them come so near to the reticulated parents, that they will be preferred in cultivation for ornament. Equestre is a plant of singular constitution, and frequently lost in the stoves: though a native of the hottest regions of the west, it will not live if watered constantly in the stove. It requires absolute rest in winter in a moderately cool but not damp situation; it will flower early in the summer, and after flowering should be placed in the greenhouse, or in the open air, where it will grow better than in the stove. Regium requires less care, the stove, and rest in winter. The whole family of bulbulosum, except crocatum, are easily managed. By giving them two periods of rest, in winter and again at midsummer, they, as well as the mules regio-vittatum and rutilo-regio-vittatum, may often be made to flower in the spring and autumn. I have found great advantage with bulbs that were to stand on a hot flue in placing under them a shallow tray made of tin or zinc, and nearly filled with sand. In pursuance of this system of encouraging their growth by moist warm sand underneath, a gentleman to whom I had given several tender bulbs informed me that he had constructed a pit for them with a chamber into which was introduced a slender steam-pipe, perforated with small holes; and the chamber was covered with hurdles, over which he placed a layer of brush-wood, and on that a body of sand in which the pots were plunged.


Tala. 18.
5
1
1
1. Sph. coccinea
ex Flora Per.
3
2
5
3
2. B. Caraccensis
2
3. Fanningiana.
4
4
S. Herbert. del.
4-5. Salsilla. var.

The steam worked its way through into the sand, and kept up a moist warmth which was very congenial to the tender bulbs during their season of growth; and I do not conceive that any better mode of cultivation could be adopted. A bed of the various splendid Hippeastra successfully cultivated in a low narrow house, would exceed most vegetable displays in beauty. Some of the varieties of H. bulbulosum, if not all, may be found in South America, growing in black vegetable earth. My collector found pulverulentum in such soil with the scape three feet high and the leaves as long: and I discovered equestriforme growing unperceived in a mass of parasitic plants, Cereus and Pitcairnia, which had been torn off a stem or the face of a rock. I have however lost so many bulbs by the use of peat at various times, that I am generally fearful of using it. There is so much variety in the vegetable black earth of different places, that it should be tried cautiously. I have been told that H. calyptratum has been found growing on the branches of trees, and that it has been necessary to shoot off the limb by repeated discharges of a gun in order to get the bulb: and I have seen it grown in a pot of moss. The principal causes of the sickly state of Hippeastra in cultivation are too light a soil, want of water when the leaves are pushing, and too much water after. I have observed them grow with unusual vigour in a split or broken pot in consequence of a better drainage. The finest bulbs I ever saw were three self-sown seedlings from a cross-bred plant, which established themselves in the pot where Convolvulus Gangeticus was growing. They killed the Convolvulus and at last broke the pot, and have not been so vigorous, since, in consequence of its falling to pieces, it became necessary to shift them. It is evident that good drainage is essential to their health. With earth that sets firm, that object may be effected better by a single crock placed carefully so as to cover only part of the hole, than by many, of which the lowest covers the aperture, and the remainder become choked by the earth settling amongst them. I have had seedlings of crosses with vittatum which sent up two stems of blossoms from a pot scarcely twice the size of the bulb. A self-sown seedling established itself in one of my stoves, and is growing freely on a stump of wood, into a cavity of which a little peat had been thrown to encourage the growth of a Pleurothallis; and I do not doubt the bulbs being often found on old trees amongst the ferns and other parasites; but I consider a well-drained rich alluvial soil to be most fit for bringing them to perfection. They appear to have gone rather out of favour lately with cultivators, probably from failures through mismanagement, for certainly they can be surpassed by few flowers in beauty; and most of them may be cultivated in a warm greenhouse, if they are kept quite dry in the winter; but it should be always remembered that very tender bulbs, which are to be kept dry in a greenhouse, will rot if above ground from the dampness of the atmosphere, though they would have been uninjured if closely covered by dry earth.

It is now pretty well understood that although cuttings of Camellia Japonica strike root readily in sand, a light and confluent soil is fatal to the growth of the plant, causing the young leaf to turn yellow, become spotted, and fall off, especially if exposed to the sun; a well-drained stronger soil being essential to their health. Most sorts of Hippeastrum seem to me liable to suffer from the same cause, which is apparently too rapid evaporation of the moisture which they require: the more frequent watering, which becomes necessary to the developement of their leaves, occasions the decay of the fibres. Due attention to this point will make the cultivation of the bulbs of this genus easy to those who have been unsuccessful in their treatment, always bearing in mind that, the stronger the soil used, the more perfect should be the drainage. Strong loam and a cool situation, with complete rest in winter, suits H. vittatum, and I believe that Aulicum will succeed best with the same treatment. I consider that Hippeastrum generally does not thrive well in soil which is powdery when dry, and does not set.

If half the outer shell of the seed of Hippeastrum is carefully taken off with a penknife, the duct from the umbilicus to the opposite extremity, which is the region of the chalaza, will be seen passing circuitously at some distance from the embryo; and another duct from the foramen to the radicle of the embryo, the two apertures being closely approximated. The main nourishment from the umbilical cord appears to be conveyed to the summit of the cotyledon.

I have no reason to believe that this occidental genus has been found in a wild state north of the tropic of Cancer. Its natural limits seem to coincide nearly with the tropics in the western hemisphere, exceeding them a little in the southern latitudes. The discovery by Drummond of the Chilian Allium Cowani and Bonarian Habranthus Andersonianus in Texas, renders it less improbable that Hipp. acuminatum should be a native of Mexican Oaxaca as well as of Brazil.

V.). p. 3

33. Phycélla.—Perianth with segments regular, convolute; filaments alternately equal, inserted alike at the mouth of the tube, decurrent, straight, recurved at the point; anthers short; incumbent, versatile; style sloping downwards. (Observ. *Bulb ovate, black; leaves linear, lorate; umbel unequally pedunculated; flower declined; stigma simple, dilated, fimbriated at the end; faucial membrane not defective on the lower side, as in Hippeastrum; properly setiform or subulate, but its diversities are not sufficiently ascertained.*)

1. I'gnea.—Leaves tipped with red; peduncles long; perianth yellow below, scarlet upwards; two awl-shaped processes at the foot of each sepaline filament; style longer than the filaments, filaments than the perianth; perianth about 2½ inches long.

Var. 1. Corúsca.—Lindl. Trans. Hort. Soc. 7. 1. 74. Am. ignea, Bot. Reg. 10. 809. Style much longer than the filaments, which are white. According to Professor Lindley, the processes are one-third the length of the filaments; but I cannot help suspecting an error in his memorandum, for I have met with no process of such dimensions in the genus. Found in sandy soil by Poeppig near Concon in N. Chili.

Var. 2. Glaúca.—Bot. Mag. 53. 2687. Leaves glaucous; style scarcely longer than the filaments; filaments red; processes very minute.

2. Cyrtanthoeídes.—Bot. Mag. 50. 2399. Leaves green; peduncles very short; perianth greenish yellow at the base, the rest red; petaline filaments quarter of an inch longer than the others, quarter shorter than the style; all red. The inside of the flower was not examined by Dr. Sims, whose specimen was evidently diseased. Professor Poeppig recognised this plant, as distinct from ignea, on the sandy maritime hills near Concon in N. Chili, but he gives no particulars; and he did not favour me

with any answer to the inquiries I took the liberty of making about the Amaryllidaceous plants he collected in Chili, concerning which the notices he printed are not sufficiently explicit: but it is rather my duty to apologise for having intruded on the occupations of Professor Poeppig, than to complain of his silence.

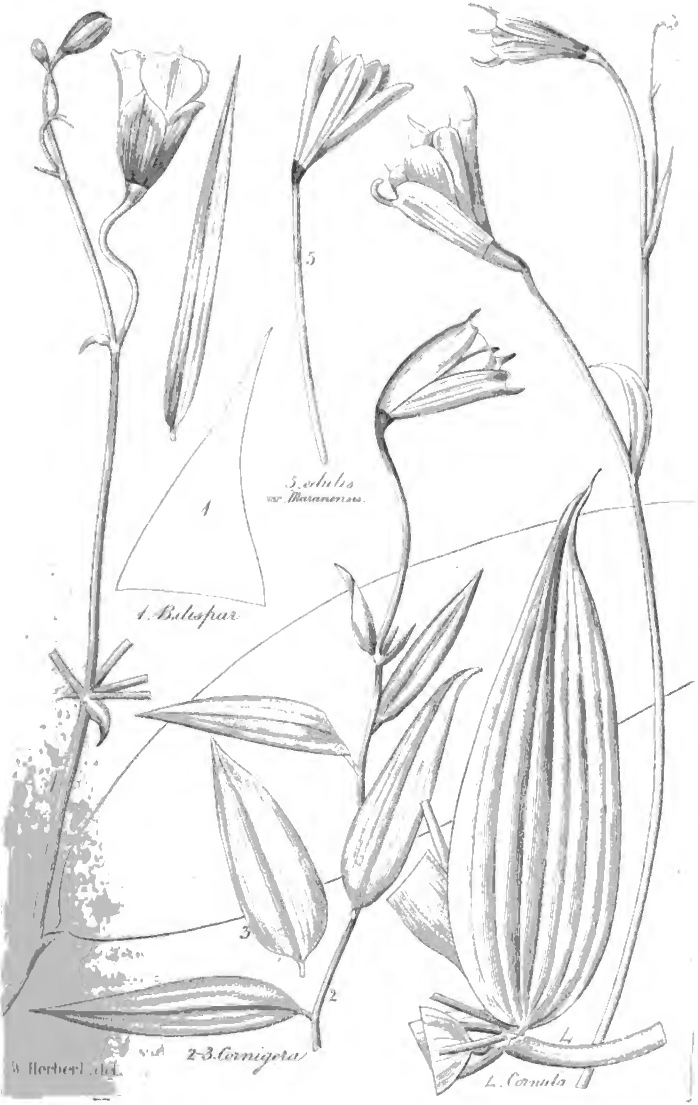
3. Magnífica.—Perianthii tubo semunciali, limbo $2\frac{3}{4}$; stylo filam. et perianth. semunc. longiore (appendicibus, ni fallor, inconspicuis).

Var. 1. Pl. 24. f. 16. Specim. ex Limache et Colmo, Bridges. Herb. Hooker. foliis $2\text{-}2\frac{1}{2}$ ped. $\frac{1}{2}$ unc. vel ultra lat. subacutis, scapo pedali; spathâ 2-unc. pedunc. unc. germ. oblongo, tubo rubro, limbo rubro colore aureo inferne admixto.

Var. 2. Pl. 24. f. 12. 13. et 14. Specim. ex Valparaiso, Cumming, 456. Herb. Hooker. absque foliis. Scapo 9-unc. pedunc. $2\frac{1}{4}$, tubo rubro, limbo duâbus partibus inferioribus aureis, superiore rubrâ. Much the most splendid species of Phycella yet known. The leaves of Var. 1. grow to the length of two feet and a half; the tube half an inch long, red; and the limb red upwards, red and golden mixed below. Var. 2. has longer peduncles on a shorter scape, tube red, but the lower part of the limb pure golden. In both the flower is three inches and a quarter long. I cannot ascertain that they have any faucial appendages, but I have only seen dry specimens. This genus, which shows much internal diversity with a great general similarity of aspect, seems to be mainly distinguishable into species by the modifications of the faucial membrane, and without an opportunity of inspecting a fresh flower, it is difficult to come at the knowledge of the facts. Magnifica has the style half an inch longer than the limb, the filaments not exceeding it.

4. Graciliflóra.—Pl. 25. fig. 4. Specim. ex Mendozâ. Gillies. Herb. Lambert. Specim. ex valle inter Villam Vicentio et apicem montis Paramillo. Gillies. Herb. Hooker. Folia 19-unc. $\frac{3}{8}$ lat. utrinque attenuata, obtusa; scapo 3-9 unc. pedunc. 6-7, in-

Plate. 11.



W. Herbert del.

æqualibus, 1-1½ unc. perianth 1½ unc. filam. petalinis perianth. longitudine; stylo exuperante; processibus sex parvis ad basin filamentorum. Found by Dr. Gillies in November, deeply rooted in hard stony ground, between Villo Vicentio and the top of the Paramillo; said to grow also in Chili under the name Mancayo, but the identity of the plants is not ascertained. Professor Lindley's note on Dr. Gillies dry specimen from Mendoza is, "processibus tribus squamiformibus fimbriatis;" but I have the benefit of Dr. Gillies' description made from the fresh plant of his specimen in Sir W. Hooker's herbarium, stating that it has six faucial appendages, and it is certainly the same plant. Cells about 25-seeded.

5. Attenuáta.—Perianthio rubro attenuatè infundibuliformi (appendicibus faucialibus inconspicuis ?) stylo perianthium et stamina superante.

Var. 1. Obtusifólia.—Pl. 25. f. 2. Specim. 33. Chili, Bridges. Herb. Lambert. Leaves obtuse, a foot long, above a quarter of an inch wide; perianth 1¾ long.

Var. 2. Latifólia.—Pl. 25. f. 2. Specim. ex Valparaiso, Herb. Lindl. Leaves half an inch wide, perianth 1¾ long. Grows in deep sandy loam.

Var. 3. Macraeána.—Spec. Herb. Lindl. Prope Coquimbo. M'Rae. Leaves narrow acute; perianth 1½ inch long, spathe about an inch; umbel many-flowered, segments of the limb obtuse, vivid crimson. (Appendicibus faucialibus inconspicuis? Lindl. MS.)

This species has red funnel-shaped flowers (with inconspicuous faucial appendages, according to a memorandum by Dr. Lindley concerning Var. 3, by which I understand scarcely discernible in the specimen); style longer than the limb, filaments shorter. The leaves of Var. 3. are acute and narrow; of Var. 1. wider and obtuse; of Var. 2. half an inch wide. The two last mentioned have flowers larger than Macraeana, which perhaps may differ in the internal structure. I have no means of knowing whether they have any faucial appendages, but I cannot by the dry specimens distinguish them as species from Macraeana, which, according to Dr. Lindley's memorandum, has the faucial appendages inconspicuous. I apprehend that means only not discernible in the dry specimen, where, however, they would be likely to elude the search.

6. Herbertiána,—Bot. Reg. 16. 1341. Leaves narrow, obtuse; limb slender, very little attenuated, pale red, equal to the filaments, shorter than the style; faucial membrane, according to Professor Lindley, annular, fimbriated. From Cumbre, a pass between Valparaiso and St. Jago, four or five inches below the surface. The soil adhering to the imported bulbs is said to have been black, but I should advise caution in the use of peat for any Phycella in a pot.
7. Brevítuba.—Perianthum 1⅜ unciale, basi annulari, vix tubatum, infundibuliforme, rubrum, intùs luteo-striatum; stylus perianthium et filamenta superans; filamenta pallida apice rubra, petalina limbum subæquantia; processus fauciales sex, ¼ unciales, tenuiter subulati; folia semunciam vel ultra lata. Perianth 1 inch and ⅜, red, yellow-streaked within, tube scarcely more than annular, style exceeding the limb and filaments; filaments pale tipped with red, the petaline nearly equalling the limb. Introduced into this country by Mr. Knight, of the King's Road, Chelsea, from Chili. It is remarkable from the tube being nearly obsolete.
8. Bícolor.—Amar. bicolor. Flor. Peruv. 2. 57. Leaves ensiform, umbel 6-12-flowered; peduncles bracteate; perianth sub-campanulate, 1½ inch long; tube short; segments straight, a little patent at the end, lanceolate, red with green tips; filaments straight, shorter than the perianth; two-horned scales at the base of the segments. According to Molina (Saggio, p. 129) the scape is flattened and two-edged, two feet high, flowers four, red outside, yellow often marked with red inside; segments rounded; leaves many, channelled, obtuse. Bicolor is unquestionably a Phycella from Peru. Molina's plant is from Chili; and as he does not mention the green colour, it is very questionable whether his plant was the Bicolor of Ruiz, espe-

cially as he limits the number of flowers to four with such a vigorous scape.

9. Chlorácra. — Hæmanthus dubius, Humb. et B. Kunth. 1. 281. Leaves oblong, lanceolate, subacute, smooth, above an inch wide, near five inches long; scape round, spathe many-leaved (I apprehend including bractes); umbel 7 or more flowered; peduncles 6-9 lines; perianth red with green tips, pedunculous, 1½ inch long, tube-formed; tube short; segments conniving; style straight, longer than the filaments; stigma obtuse. Grows by the river Guallabamba, near Quito, in temperate mountainous situations. This plant, allied to bicolor, is remarkable by an unusual breadth of leaf; which is a departure from the habits of the genus, perhaps the consequence of its inhabiting a richer and more humid soil.

It will be observed that the genus Phycella has, as far as we know, red flowers; that in the sandy and lower parts of Chili it seems disposed to have yellow at the lower part of the flower, in the higher regions of Peru green tips. I entertain no doubt of bicolor and chloracra belonging to this genus; the latter has probably large bractes, which gave the notion of a many-valved spathe like Hæmanthus, but I scarcely think it will be found to have many outer valves to the spathe. There are frequently in scapaceous plants inner valves or larger outer bractes, of which it is difficult to say in which light they should be considered. I should however by no means think a redundancy of valves to the spathe a sufficient cause for removing it from the genus.

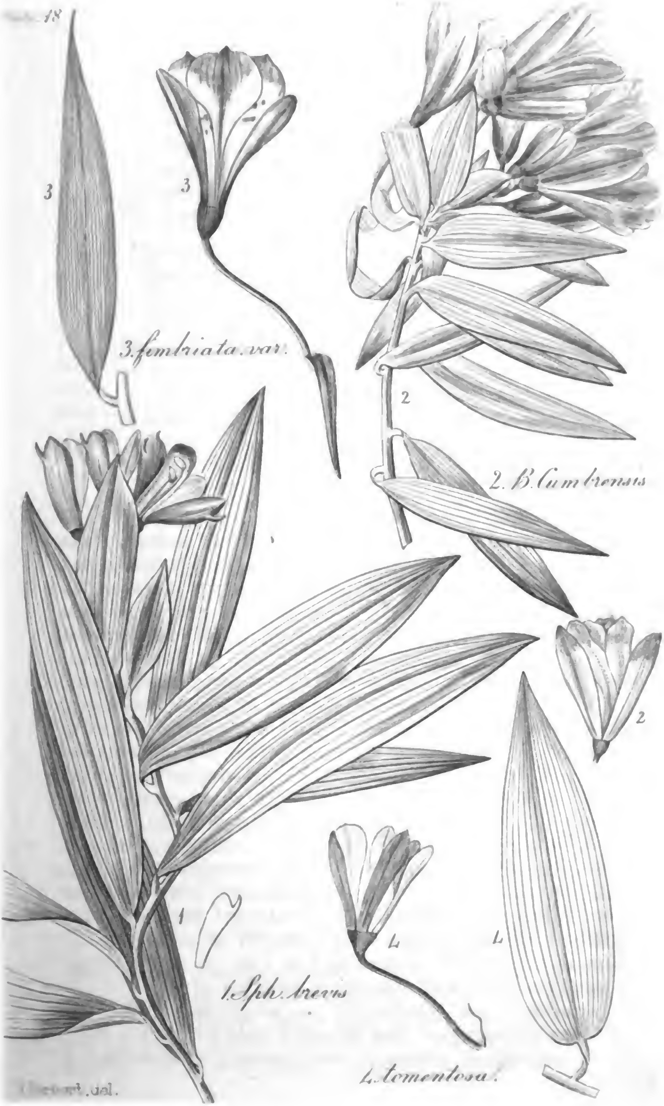
I find a decided difference of habit between Phycella, Habranthus, and Zephyranthes. Some years ago I planted three species of Phycella out of doors in front of a greenhouse, throwing a small heap of sawdust over them in winter. In that situation one of them flowered early in the summer, and they go to rest in the hot dry season. They are tempted by mild weather to push their leaf in the winter, in which case they suffer injury from severe frosts that may ensue, though they will endure a good deal; and their habit is to flower after the leaf has acquired its growth before they go to rest. The Phycellas have been found difficult to cultivate, because they have been often set in peat, though they grow naturally in a sandy or strong soil on a dry rocky substratum, and proper rest has not been allowed them. They should be planted in light soil well drained, and be left dry from the moment their leaves show a disposition to wither, till the bulbs on examination show a disposition to push out fresh fibres at their base. The old fibres in this genus seem always to perish before the plant vegetates again; it cannot therefore be injurious, and may be advantageous, to take the bulbs out of the ground when the leaves perish, and set them again when they are disposed to move. They will be best preserved while at rest in dry sand. Concerning the difference between Phycella and Habranthus, see the two first species of Habranthus, and the observations at the end of that genus. I consider that Phycellas should begin to grow in February and go to rest in August. If the leaf endures later than August, they should have six months rest before they are watered again. A sunny aspect at the foot of a south wall appears to suit them.

EUSTÉPHIA. *Cavanilles.*

This genus must be erased, as not existing in truth; the generic character being obscurely worded, and supported by a figure of the plant which I do not hesitate to pronounce fundamentally erroneous, both as to the extraordinary filaments there represented, and the pits in the tube under their point of insertion. I have no doubt that the plant intended was a Phycella, with appendages at the mouth of the tube, which have been incorrectly transferred to the mouth of the limb and fastened on the extremity of the filaments; and the tube of the flower, injudiciously called in the text a pit, has been multiplied into six pits under the several filaments, where it is almost impossible that such cavities should be placed. If such had existed, they would have been between the filaments. I apprehend that the author must have forgotten the precise intention of his own notes on the plant, and framed the figure from erroneous recollection drawn from his notes, and not from the plant itself, and I am confident that the representation given will never be verified.

34. HABRÁNTHUS.—Flower declined; perianth short-tubed, subcampanulate, not convolute, more or less patent; alternate segments nearly equal, filaments (properly of four lengths) inserted alike at the mouth of the tube, declined, recurved, semi-fasciculate; faucial

Tab. 18


3
3
3. fimbriata. var.
2
2. B. Cumbrensis
2
1
1. Sph. brevis
4
4
4. tomentosa.
del.

membrane (when manifested) annular; anthers affixed at the middle, incumbent, versatile; style declined, recurved. (*Leaves linear lorate, not exceeding half an inch wide; umbel precocious, unequally pedunculated; stigma 3-lobed; capsule turbinate; faucial membrane, as far as we know, never wanting.*) See the observations at the end of the article Habranthus.

§. 1. Pluriforæ.—(*Filamento, quoad novi, supero inter sepalina longiore, infimo inter petalina breviore. Upper sepaline filament prolonged, lower petaline abbreviated.*)

1. Phycelloídes.—Bot. Mag. 17. 1417. Large black round bulb; leaves glaucous, obtuse, ⅝ wide; umbel 6-flowered, peduncles long, unequal; perianth yellow below, scarlet above, tube ⅜, limb 2¼, style longer than the perianth and filaments; tipped with red; filaments inserted in an annular membrane.

In the character of the filaments in the Bot. Reg., the words externis and internis are transposed by a lapse. I have placed this species first; not as the type of the genus, but because it approximates to Phycella so much as to have raised a question, whether the genus Phycella could stand as distinct from Habranthus. The genus Phycella did not originate with me, and I entertain doubts whether it is in fact a distinct genus, or only a section of Habranthus with convolute perianth, filaments of alternate length and drooping style; neither do I feel satisfied of its identity with Habranthus, so as to presume to reduce it, and in fact I believe it to be distinct. The approximation of the extreme points in two nearly allied genera, is not without precedent. H. phycelloides agrees with all the Habranthi with more than one flower that I have had an opportunity of inspecting, in the elongation of the upper sepaline, and abbreviation of the lower petaline filament, in the recurved style, and the perianth not convolute, and in truth its resemblance is rather in colour to Phycella ignea than in structure, which is conformable to that of Habranthus angustus. There is some difficulty in defining the genera intermediate between Hippeastrum and Haylockia; for although there can scarcely be two less similar than Phycella and Cooperia, the edges of the intermediate genera come so nearly in contact, as to make it very difficult to be certain of the limiting features. I have never however seen a dry specimen of Phycella or of Habranthus, which I could hesitate to distinguish from each other at the first sight, or a bulb of Phycella which I could fail to recognise as such; but there is an intuitive perception of difference, especially in the look of bulbs, which it is not easy to define. The bulbs of Phycella, as far as I have seen, are never as round as those of Habranthus, nor do they ever elongate themselves beyond their regular structure. The elongation of the bulb of Habranthus is not the natural form, but its mode of drawing itself to a greater depth under ground. I wish I could excite cultivators to try if they can produce a cross-breed between Phycella and Habranthus; but I do not think they will succeed.

2. Speciósus.—Pl. 23. f. 2. Specim. Herb. Lindl. ex Conception, Chili. M'Rae. Foliis sub-sesquipedalibus (16 unc.), angustis, longè attenuatis, 3-16-¼-latis; scapo subpedali, spathâ 1½ unc. umbellâ triflorâ; pedunculis 1½ unc. germ. ¼ unc. tenui; tubo brevi, gracili; perianth 2½ unc. campanulato, saturatè rubro; stylo ¼, filamentis ¾, unc. perianthio brevioribus; stigmate obtuso. In Sir W. Hooker's herbarium there is a flower of this species ticketed Am. Chilensis. Bridges. It is not the plant recognised as Chilensis by Poeppig, which has the stigma deeply trifid, while this has it undivided. The Chilensis of Flor. Peruv. is clearly an orange bearded Hippeastrum allied to Regium and Miniatum, a variety which can never, from want of particulars, be identified. That of L'Heritier, excluding his quotation of a Pyrolirion from Feuillet, is an Habranthus, concerning which he has said so little, that it cannot be ascertained from his description what plant he meant. He calls it purple, yet quotes an orange flower as identical. I shall therefore consider Dr. Poeppig's plant, which does not contradict any thing stated by L'Heritier, to be the plant that must bear the name. H. speciosus seems by the specimens to be of a deep crimson. It has a stigma obtuse like that of Hipp. equestre, a variation which, as it occurs in that genus, cannot surprise us in this. It brings Ha-

branthus a little nearer to Phycella, by removing the difference of a trifid stigma; but in both the specimens of this plant the style is recurved, and the division of the stigma in this order is very variable.

3. Praténsis.—Poeppig. Fragm. Syn. p. 5. Leaves linear, glaucous, with the back rounded; scape a foot or more, 2-3-flowered; perianth scarlet, yellow at the base; tube scarcely any; limb two inches, campanulate, with unequal segments, the upper widest; faucial scales six, serrate; filaments declined. Flowers in November in the meadows of Antuco in S. Chili. This plant seems to me allied to speciosus, except in leaf, which appears to have a different character. Dr. Poeppig calls it "genus Placea, Miers," alluding, I suppose, to the faucial scale, but they would be insufficient to distinguish it except as a species. Placea (Miers) is a mere name, without any definition or description of the plant for which it was intended.

4. Kermesínus.—Am. kermesina. Bot. Reg. 19. 1638. Leaves 3-16ths wide, obtuse, bright green, slightly glaucous (underneath?) peduncles unequal, about 1½ inch, perianth about 2¼ long, deep crimson, ribbed at the base with yellow, suberect; filaments, "two much shorter than the rest" imply that the upper sepaline is prolonged, the longest rather more than half the length of the perianth; style one-third longer than the filaments; stigma trifid, recurved. Brazil; I doubt not, S. Brazil.

5. Nemorális.—Specimina ex Rio Grande in sylvis prope flumen (Yazeguay?) Tweedie. Herb. Hooker. absque foliis. Scapo 4-unc. trifloro, spathâ acuminatâ 2-unc. pedunculis inæq. subbiunc. perianthio kermesino biunciali, angustè campanulato, vix stylo semunciam longiore; stylo fil. vix superante, stigm. trifido. This flower, called bright scarlet by Tweedie, but seeming bright crimson, was found in the woods by some river which cannot be deciphered (the Yazeguay, I believe), near Rio Grande. It comes very near to kermesinus, and is probably a variety of it, but the specimens agree in a 4-inch

scape, longer spathe, and filaments greatly longer than those of kermesinus. The leaves are wanting.

6. Intermédius.—Am. intermedia. Bot. Reg. 14. 1148. Ex Braziliâ. Leaves bright green, obtuse, $\frac{1}{4}$ wide; scape green (six inches?) peduncles $\frac{3}{4}$ to $1\frac{3}{4}$, green; perianth about 2 inches, patent, red, greenish yellow below; style and filaments as in Nemoralis. A much more expanded and differently coloured flower.

7. Spatháceus.—Spathâ univalvi, latere fisso, floribus magnis purpureis. Spathe one-valved, slit on one side; flowers large purple; leaves green.

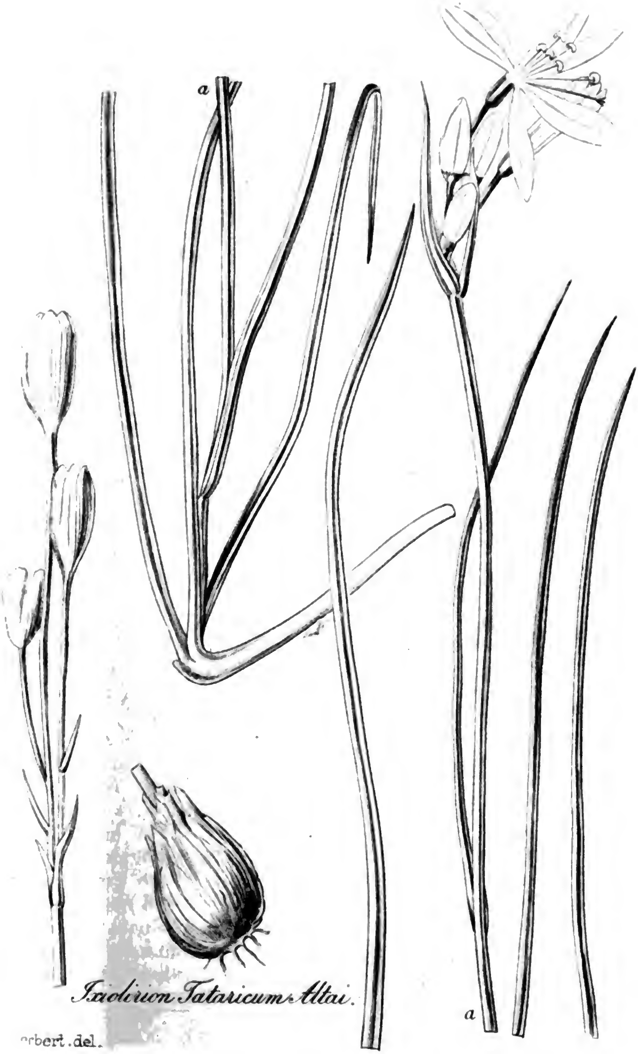
Var. 1. Leaves broader, flowers larger.

Var. 2. Angústus.—Bot. Mag. 53. 2639. Leaves green, narrow, spathe one-valved, slit on one side to the base, tube green, limb, style, and filaments purplish red; segments narrow. In all points narrower than spathaceus. V. 1. Membrane annular.

8. Bífidus.—Bot. Mag. 52. 2597. Spathe 2-valved, $2\frac{1}{4}$ inches long, green; scape green; flowers four, 2 inches long, purplish red, darker and lined with green below. Membrane annular.

Var. 2. Litorális.—Specim. ex Monte Video. Tweedie, Herb. Hooker. Spathâ bifidâ 5-florâ, perian. satur. purpureo; absque foliis. Spathe bifid 5-flowered, perianth deep purple; without leaves. Plentiful within tide-mark at Monte Video. Tweedie writes that the leaves are like those of Nerine venusta, commonly called Guernsey lily, but they are probably not so wide. This may, perhaps, be the plant formerly named by me lorifolius, from Maldonado, which has never flowered here, and, as I cannot ascertain whether it is distinct from all Tweedie's specimens, it becomes necessary to drop the name, at least for the present. The bulbs, so named, increase fast by offsets, and elongate themselves very much, appearing to strive to get deep under ground, and, I believe, they will not flower while the bulb is elongated. I am now trying various modes of culture to bring it to a flowering state. Litoralis growing within tide-mark may require salt.

Tab. 19.



Ixiolirion Tataricum Altai.

rbert. del.

9. Púlcher.—Pl. 26. f. 1. Specim. Tweedie. Herb. Hooker. absque foliis. Scapo 3½ unc. spathâ 2¼ unc. bifidâ apice non diviso, pedunc. quinque, ¾-3¼ unc. germine crasso, perian. 1⅞ (albo? erubescente?) stylum ¼ unc. superante; stylo filamentis longiore, stigmate trifido. Flowers five, apparently white or blush. Upper sepaline filament decidedly prolonged, and lower petaline abbreviated. The inequality of the peduncles is very conspicuous. From Buenos Ayres.

10. Pedunculósus.—Pl. 26. f. 3. Specim. Tweedie. Herb. Hooker. absque foliis. Scapo unciali bifloro; spathâ tubulosâ apice bifido; pedunc. 3-unc. germine longo gracili, perianthio angusto 2-unc. vel ultra, laciniis acutis, stylo unc. ferè longioribus (pallidè rubris?) filamentis stylo brevioribus; stigmate trifido reflexo. From Buenos Ayres. A remarkable plant, the scape being only an inch, and the two peduncles each three inches long, the peduncles remarkably slender and the spathe tubular. If it should appear on inspection of these six Bonarian plants that the annular membrane at the base of the filaments is precisely similar, they might, perhaps, be united as local varieties of one Habranthus Platensis; but without more intimate acquaintance with them, the union would not be advisable. I have some Habranthi from the Plata which have not yet flowered with me, and vary a little in leaf, but certainly belonging to the same family. These species all require to be plentifully watered in a greenhouse or frame in the winter, and their leaves ought to grow out to the length of near two feet. As soon as the leaves decay, they should be left quite dry, and if placed in a hot situation it will promote their flowering.

11. Hespérius.—Foliis glaucis, perianthio patente reflexo, annulo fauciali fimbriato, filamentorum quaternâ discrepantiâ obsoletiore.

Var. 1. A'dvena.—Amar. advena. Bot. Reg. 10. 849. Bot. Mag. 28. 1125. Leaves channelled, rather glaucous, ¼ inch wide; 2-6-flowered; flowers red upwards, yellowish green below; peduncles 2 inches and under. A delicate plant, apt to rot; probably a native of dry situations. It should certainly not be planted in peat.

Var. 2. Pállidus.—Lodd. Bot. Cab. 1760. Am. advena, var. citrina. Bot. Reg. 10. 849. Specim. septemflorum. Cumming, 395. Valparaiso. Herb. Hooker. Spec. 4-florum. Am. advena, Cumming. Valparaiso. 183. Herb. Lindl. Leaves less channelled, more glaucous and recumbent than those of Advena, $\frac{1}{4}$ wide, obtuse; flowers 2-7, pale yellow, sometimes tinged with red; varying in different individuals between sulphur, white, and red; peduncles shorter than in Advena; umbel more numerous than Chilensis.

Var. 3. Miniátus.—Pl. 26. f. 2. Sweet Brit. fl. g. ser. 2. 213. Specim. ex Valparaiso, Cumming, 355. Herb. Hooker. with the scape $8\frac{1}{2}$ inches, spathe 3 inches acuminate, peduncles $\frac{5}{8}$ to $2\frac{5}{8}$, perianth patent, $1\frac{3}{4}$ long, segments acute, style trifid, half an inch shorter, but a little longer than the filaments; upper sepaline filament little elongated, but not equal, as stated by Sweet; leaves wanting, said by Sweet to be glaucous. Faucial membrane not recorded, but it will probably be found to agree with Advena and Pallidus, under which expectation I venture to include it under a name implying that they inhabit the extreme West. I do not believe the seed of Advena would ever produce Pallidus, and it would be incorrect to call the latter a variety of the former; but where the distinction, however permanent, is not great, it will be found very convenient to unite those which agree in most essential points under a superior name, which produces no change in the nomenclature, but gives a clear view of the affinities of the local variations of the genus.

12. Bagnoldiánus.—Bot. Reg. 17. 1396. Specim. Cumming ex Coquimbo. Herb. Hooker. Bulb large, black; leaves obtuse, glaucous, $\frac{3}{8}$ wide; scape green, 6-flowered; peduncles 3 inches and under, tube $\frac{1}{4}$, limb 1 and 15-16ths long, yellow, spotted within with pale red, especially on the three upper segments; upper sepaline filament much prolonged, and lower

petaline shortened; faucial membrane annular fimbriated. In the Bot. Reg. the words internis and externis, relating to the filaments, are transposed by a lapse.

Var. 2. Gillesiánus.—Pl. 23. f. 1. Specim. ex Melocoton. Dr. Gillies. Herb. Hooker. "Perianth yellowish with a tinge of red, deeply divided, segments ovate-lanceolate with a point, 1½ inch long, at the base attenuated and greenish; filaments yellowish, fimbriated membrane at their insertion; anthers green before inversion; bulb size of a pigeon's egg, black. Found in gravelly soil near Melocoton." *Gillies.* The peduncles do not exceed an inch, the spathe two inches; leaves four, a foot long, only $\frac{1}{8}$ wide; flowers much paler than in Bagnoldianus, sulphureous; but it is certainly to be called a variety of that plant. It will be observed that both these plants have the glaucous leaf and fimbriated membrane of the Hesperian family, from which they are separated by the more decided prolongation of the upper and abbreviation of the lower filament, the appearance of the bulb, and harder foliage. They are natives also of the same coast as Hesperius. I lost Bagnoldianus by planting it in a peaty compost, not being then aware that it grew in dry gravel, and I understand that it has rotted in most collections. A most singular lusus occurs in a specimen of that plant in Sir W. Hooker's herbarium, of which one of the peduncles is compound, bearing two flowers and a bracte, like one of the valves of the spathe, at the fork.

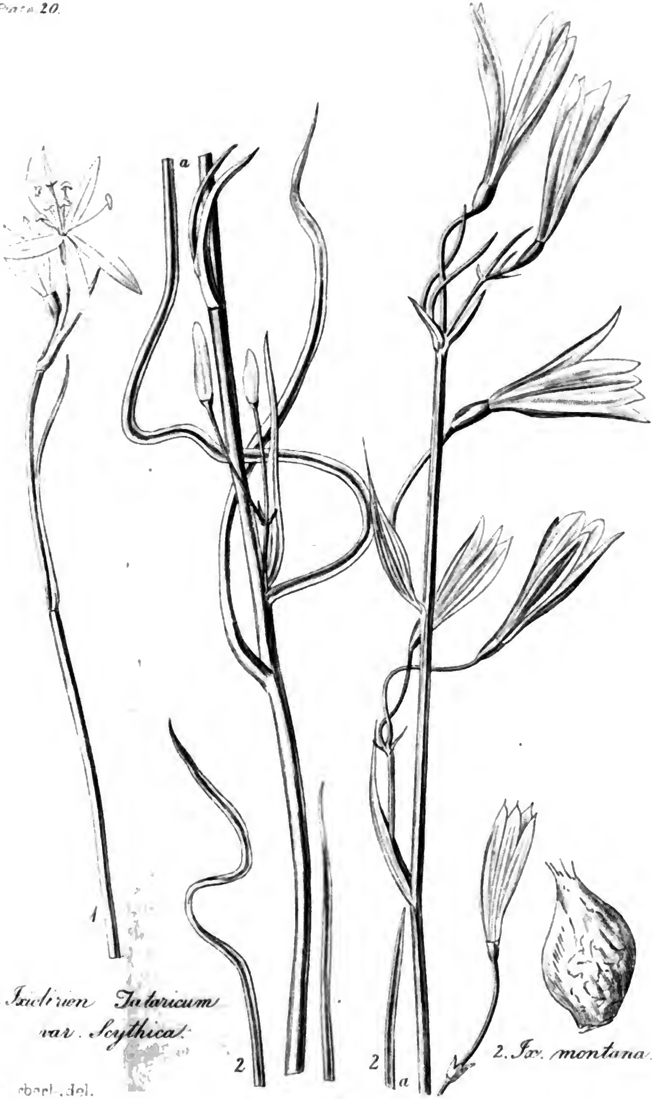
§. 2. Subbifloræ.—*One or two flowered.*

13. Róseus.—Sweet. Brit. fl. g. ser. 2. 107. Leaves glaucous; flowers two, rose-coloured, green at the base, expanding wide; filaments conspicuously of four lengths. Faucial membrane not recorded. From the island of Chiloe.

14. Chilénsis.—Am. Chilensis. L'Heritier S. A. p. 11. (excluso Feuillet cit.) non Ruiz Flor. Per.—Poeppig Frag. syn. 5.—Am. lutea. Specim. Ruiz. Herb. Lamb. Zephyranthes lutea. Herb. App.—Am. ochroleuca? Ker. Bauer tab. pict. Bibl. Banks,

filamentis (vix rectè?) conniventibus. Leaves linear; spathe 1 or 2-leaved, according as it has one or two flowers, pedunculated. *L'Herit.* Leaves vernal, scarcely to be gathered at the same time as the scape; flowers very pale sulphur or vermilion, the colour being very variable; stigma deeply trifid. *Poeppig.* L'Heritier's description is quite insufficient for the identification of his plant, and his quotations are erroneous. It is strange that he should have called his flower purple, and yet quoted Feuillet's orange Pyrolirion as the same. Ruiz's Chilensis is a bearded Hippeastrum, with leaves attenuated at both ends, a variety of Miniatum or Regium. Dr. Poeppig has brought home specimens, and if his plant be not Habranthus pallidus, it must keep the name Chilensis. I believe the Am. lutea of Ruiz and Pavon's herbarium to be L'Heritier's plant. I have a small bulb, sent from Chili under the name Chilensis, with two leaves scarcely a line wide, acute, shining green, which is probably this plant. According to Poeppig the flower of Chilensis is autumnal, rising before the leaves, which in my plant are hiemal; he calls them vernal, that is they endure till the hot season. Chilensis was found by him in sandy fields near La Vega de Conception in S. Chili. Molina, p. 129, calls it coccinea, flowers bright red, seldom two; anthers yellow, genitals red, spathe two-leaved; scarce exceeding a foot; leaves linear, about equal to it. I suspect that Mr. Ker's Amaryllis Ochroleuca, taken from a drawing by Bauer in the Banksian Library, must be one of the varieties of this plant. The drawing represents the flowers with obtuse deeply divided segments, of a deep greenish yellow with reddish veins, erect, very little expanded, conniving filaments, and anthers short, incumbent, and attached by the middle. Mr. Ker's engraving *(Journ. Sc. and Arts)* is very accurate. It is decidedly not a Zephyranthes, from the structure and attachment of the anthers, nor has any two-flowered Zephyranthes been seen. I think the drawing must have been made before the full expansion of the flower, and before either

Plate 20.



1. Ixiolirion Tataricum var. Scythica.

2. Ix. montana.

ebarl. del.

the perianth or stamens had assumed their proper attitude. No memorandum exists concerning the plant, which flowered at Kew at a period when Chilian bulbs were certainly not likely to find their way there. If it be one of Masson's bulbs from the west coast of Southern Africa, it must belong to a genus entirely unknown to us; for if the drawing exhibits a correct representation of the inflorescence in its perfect state, it agrees with no genus yet described. It wants the tube that should connect it through Vallota with the Cyrtanthiform race, and has no affinity to any other African bulb.

15. Gracilifólius.—Bot. Mag. 51. 2464. From Maldonado. Bulb small, leaves very slender, a foot and half long, nearly cylindrical, with a deep channel on the upper surface; scapes successive, seven or eight inches high; spathe green, tubular, slit at the point; flowers 1-2, 1 inch and $\frac{3}{8}$ long, tube green with a thick green annular membrane, limb pale purple, closing at night, and expanding widest in the sun, stigma trifid. Flowers freely in September after three or four months' rest. Gracilifolius and Andersonianus expand in the sun, but with the flower declined and the lower petal protruded, not patent like Zephyranthes.

Var. 2. Boothiánus.—Tab. pict. et descr. W. B. Booth. Spathâ pedunculo et germine erubescentibus, germine et pedunculo magis elongatis, filamentorum quaternâ discrepantiâ obsoletiore, stigmate majore. In specimine scapus 1-florus. Ex Maldonado.

This plant, which has flowered at Sir C. Lemon's, is only distinguishable from Gracilifolius, which grows in the same vicinity, by a rather longer germen and peduncle, a red tinge on the germen, peduncle, and spathe, and the diversity of the filaments being less marked, but they are not exactly of two lengths in the specimen. The flower seems also a little more declined, and rosier. The specimen was 1-flowered; whether it will be found to be always so I know not; but I think it not improbable, as the plant is evidently, from the near equality of its filaments, the intermediate point of transition from the two-flowered to the one-flowered section, which has exactly the opposite discrepancy of filaments.

16. Sylváticus.—Martius ap. Schultes. Leaves shorter than the spathe, 1 line and ½ wide; scape green, 4½ inches; spathe 15 lines, one-third divided; peduncle 14-15 lines; germen ovate, 1½ line; perianth inclined, 2½ inches; tube half an inch, green, with a thin faucial membrane; limb funnel-shaped, green below, above purplish scarlet; upper sepaline filament prolonged, lower petaline abbreviated. In the woods called Catingas, of the province of Bahia. There are lofty Sierras in Bahia, where I suppose this plant is found; for the genus Habranthus, so far as we know, only exists in temperate situations.

§. 3. Unifloræ.—*One-flowered.*

Filamento sepalino superiore abbreviato. Upper sepaline filament shorter.

17. Versícolor.—Bot. Mag. 51. 2485. Leaves ¼ inch wide, above a foot long, acute; scape, spathe, and perianth at first rosy, fading before expansion; perianth two inches long, white tinged with pink, tipped with red and lined below with red, on each side of a green midrib; stigma large, white, trifid, patent; faucial membrane fimbriated. If my dissection of the flower in the Bot. Mag. is correct, it disagrees with Robustus and Andersonianus in the prolongation of the lower sepaline filament. I have had no opportunity of re-examining it since the introduction of those species, my gardener having destroyed the bulbs of Versicolor by watering them during the season of rest.

18. Robústus.—Sweet Brit. Fl. g. 2. 14. Lodd. B. Cab. 1761. Am. tubispatha. L'Her. S. Ang. 9. Am. Berteri. Spreng. S. V. 2. 49. Leaves subglaucous, channelled, scape robust, spathe undivided two-thirds of its length, a little shorter than the peduncle; flower 3½ inches long, much declined, purplish pink fading to white; tube scarcely any; faucial membrane greenish, fimbriated? sepals much wider than the petals, but four grada-

tions very distinct; upper sepaline and lower petaline filaments abridged; stigma trifid. This plant increases fast by seed and offsets. The bulbs are killed by frost, if left through the winter in the open ground in England without protection. They will grow freely if kept dry in the winter, and planted out in the spring; but they should preserve their leaves through the winter, and be kept dry and hot in the spring or early summer to promote their flowering, which under that treatment is abundant. Mr. Ker was too hasty in identifying a Jamaica plant with Commerson's Am. tubispatha from Buenos Ayres. I think there can be little doubt that this Habranthus, which equally agrees with L'Heritier's imperfect description and is a native of Buenos Ayres, must be the true plant, and strictly I ought to restore the name; but the rule concerning priority of names was established for public convenience to avoid confusion, and, as the name tubispatha has now been generally applied to a tropical Zephyranthes, it would be inconvenient to make a change, and it is quite sufficient to point out the fact.

19. Púmilus.—Lodd. Bot. Cab. 1771. Leaves narrow, scape short, flower patent, cernuous, rose-coloured; faucial membrane and filaments not observed. From Chili. I have never seen Sweet's 2-flowered Hab. roseus, and am not sure of its diversity from this plant, of which I have not seen the flower.

20. Maculátus.—L'Herit. S. A. 10. Scape speckled with red lines; spathe 2-valved linear, flower pedunculated, filaments and style declined; perianth campanulate. From a specimen brought from Chili by Dombey. Colour not known. The description of this plant is much too vague to admit of its ever being identified with any certainty. The name should be attached to the first Chilian Habranthus with a speckled scape that shall be discovered.

21. Andersoniánus.—Bot. Reg. 16. 1345. Lodd. B. Cab. 1677.—Sweet Br. fl. g. ser. 2. Leaves narrow, linear, acute, green or subglaucous; spathe tubular,

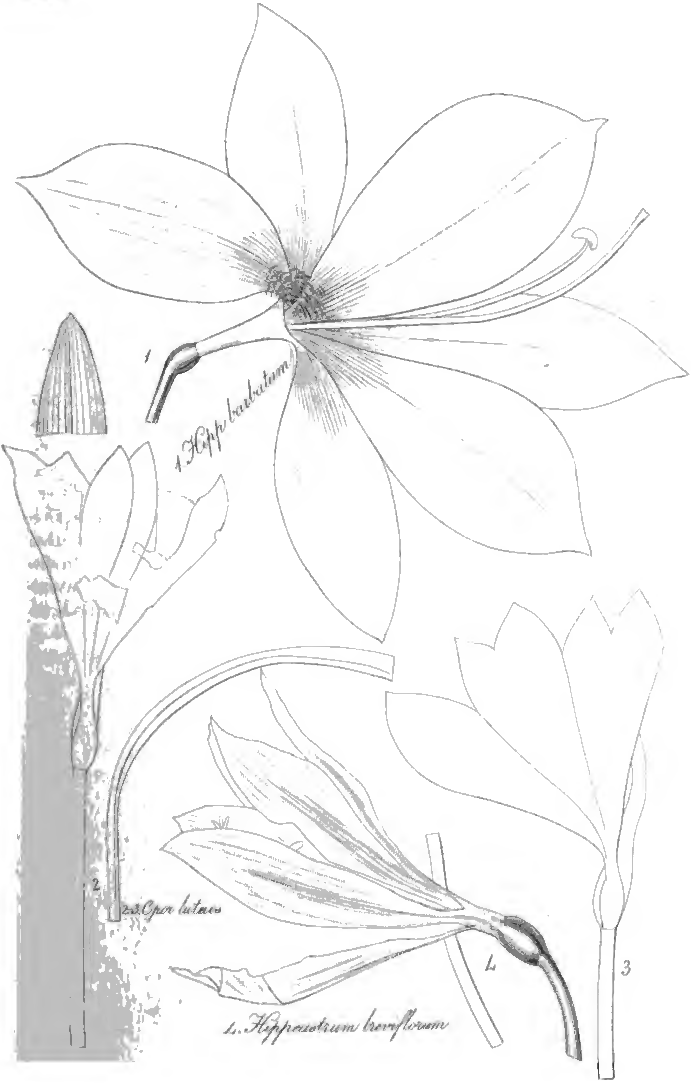
divided upwards, peduncle about 1½ inch long or more, perianth golden or copper-coloured, streaked outwardly and marked at the base within with reddish brown; faucial membrane annular. Lower petaline and upper sepaline filaments abbreviated. Peduncle elongated in seeding. From Buenos Ayres. Varies in the depth of colour of the flower, and the breadth and glaucous hue of the leaf, in different localities. The variation of leaf seems permanent in the seedlings.

V. 1. Aúrea, golden. V. 2. Cúprea, coppery. V. 3. Obscúra, dark, especially in the bud. V. 4. Brevilímba, short-flowered, with broader leaves. V. 5. Párvula, small. Pl. 26. f. 4. V. 6. Texána, Texan, with roundish obtuse segments.

This bright-coloured Habranthus was imported from Monte Video in 1829, and I noted the first four varieties amongst the bulbs which flowered in 1830, having been parcelled as different by the collector. The fifth is known to me only by a Bonarian specimen from Tweedie, Herb. Hooker. The sixth was sent by Drummond from Texas, where the Chilian Allium Cowani has also manifested itself in the Northern Hemisphere. I doubt whether it is distinguishable from the first variety, but I have not seen them in flower together. Both Andersonianus and Robustus are disposed to flower earlier than Gracilifolius and Versicolor.

22? Andícola.—Am. Poeppig Fragm. Syn. 5. Diar. 3. 833. Leaves linear, glaucous, smooth; scape 6-7 inches, glaucous, one-flowered; spathe approached to the flower, two-valved, reaching to the middle of the perianth; perianth erect, near two inches long, subbilabiate, segments nearly equal, splendid violet colour; tube 3-4 lines long, throat smooth; stamens very short, deflex. Dr. Poeppig does not state whether there is a peduncle shorter than the spathe or none, but he refers the plant to Habranthi. The perianth said to have a tendency to be bilabiate and the filaments to be deflex point to that genus; but a sessile or subsessile germen, erect perianth, and very short stamens, are at variance with that genus, and I cannot but doubt whether it will not be found to be a Zephyranthes

Plate 21


1
1 Hipp barbatum
2
2.3. Cypr luteus
3
4
4. Hippeastrum breviflorum

allied to Carinata. The insertion of the filaments into the anthers should be examined; and it should be observed whether the spathe is absolutely divided to the base. This beautiful little plant flowers in January, in cold gravelly situations, on the Andes of Antuco in S. Chili, especially on Pico del Pilque, and, if we could obtain it, would probably thrive in our climate.

It may be observed that no Habranthus has been yet found with the leaf more than $\frac{3}{8}$ths of an inch wide; nor any Phycella much exceeding half an inch, except Chloracra (the Hæmanthus dubius of Humboldt), which may possibly prove to be a genus by itself; and that no Hippeastrum has been discovered with the leaf near so narrow. This is not a very fit circumstance to be set down in a generic character, but it is an important confirmatory observation, and valuable as a guide in the discrimination of unknown plants of this family, especially in an order of which many genera as Brunsvigia, Eurycles, Stenomesson, and others, may be recognized by the leaf. Concerning some of the Habranthi my information is defective, but fourteen are ascertained to have the faucial annular membrane, and the absence of it has not been observed in any one. In Hippeastrum it is never annular, but confined to the upper region; in Zephyranthes, when the membrane is at all manifested, it is nearly obsolete; in Phycella its exhibition is properly setiform, and the departures from that form require to be carefully examined, which I have had no opportunity of doing. Dr. Lindley noted down the membrane in Phycella Herbertiana to be annular, but it may, perhaps, not have been precisely the same structure that I call annular in Habranthus. The flower of Habranthus rises after the dry season of rest, and is followed by the leaves, which endure through the winter; Phycella flowers after the complete production of the leaves, and rests after flowering; Zephyranthes rests in the winter and flowers with or after the rise of the leaves, the flower expanding in the sun; Argyropsis has the leaves perennial and the flower autumnal; Cooperia appears to flower from the earliest spring till the autumn, the flower being at its prime in the first night of its expansion. The Habranthi in general are pretty hardy, but as their leaf should be in perfection in the winter, it must be liable to injury from frost if not protected in some manner;

they require, in order to prepare their blossom, a hot period of rest, which would be often wanting to them if exposed to our climate. When cultivated in a border, they should be covered with a glass frame, to keep them hot and dry in May, June, and July, and any covering of mats or straw that will prevent injury from severe frost may be sufficient in winter; or they may be taken up when the leaves decay, without breaking the fibres, kept in sand, and reset three months after. As most of these bulbs are found in dry gravelly situations, they must require the border to be well drained, which should be done by a layer six inches deep of stones covered with an inverted sod, or at least with heath, furze, or straw. The same system may be pursued with advantage in deep pots for all plants that are liable to suffer from wet, as Habranthus Bagnoldianus, and Hesperius, placing a thin inverted sod, or some other covering, over the crocks or stones, to prevent the drainage from becoming choked, and with that precaution stronger soil may be used than would suit otherwise, and less water will be necessary.

35. ZEPHYRÁNTHES.—Leaves linear; scape one-flowered; spathe one-valved; germen sessile or pedunculated, erect; tube short, funnel-shaped; perianth suberect; faucial membrane inconspicuous, not annular, manifested (if at all) by six very minute points above the insertion of the filaments, which is at the base of the segments just without the tube, the sepaline inserted a very little lower, and shorter; anthers suberect, versatile, attached below the middle, sloped. (Stigma usually trifid, patent; capsule ovate, deeply 3-furrowed; seeds less numerous than in Hippeastrum; style generally declined, the opposite filament being averted.) *Leaves narrow, æstival, produced in the spring; flower simultaneous or later.*

A. Pedunculated.

1. Mesóchloa.—Bot. Reg. 16. 1361. Leaves green; spathe looped; perianth half-green, above white, stained with red outside, segments acute, tube very short, smooth within, style white, an inch shorter than the limb, very little longer than the filaments. I have placed this first, not as the type of the genus,

but because it approaches nearest to Habranthus, the flower being produced later in the summer, and not expanding so freely in the sun as the rest of the genus; and if my representation of its anthers in the Bot. Reg. is quite correct, there is a difference which requires to be re-examined. It varies with a spathe bifid at the point and flower yellower, and with a shorter peduncle and flower not marked with red. From Buenos Ayres. It flowers and seeds freely. Some seedling bulbs having been left out in a bed covered with leaves in winter, though but just under-ground, survived, and sprouted in the first week of May. I do not doubt its succeeding in a bed of white sand covered with leaves in winter.

2. Depauperáta.—Poeppig Frag. Syn. 4. Diar. 3. 795. Leaves vernal, very narrow, linear; pedunculated, spathe far from the flower, tubular, bifid; limb erect, campanulate, regular, very acute, pale sulphur with purple external streaks; throat naked; filaments straight, nearly equal. In sandy stony fields of the Andes of South Chili. It seems very nearly allied to Mesochloa. Dr. Poeppig has not stated in what respect it is depauperated.

3. Atamásco.—Am. Atamasco. Bot. Mag. 7. 239. Lodd. B. C. 1899. Catesby Car. 3. 12. Leaves green, tube half an inch, limb large, white, bright red outside in the bud, white after expansion. Abundant in pastures of Virginia and Carolina. To be kept dry in the greenhouse in winter; if planted out it should be set in white sand, to prevent the roots rotting while at rest. Sprengel made a great mistake in uniting the sessile Verecunda with this species as a variety.

Var. 2. Minor.—With smaller flowers, more obtuse. Introduced by Fraser from Carolina; not materially different.

4. Tubíspatha.—Bot. Mag. 38. 1586. Not L'Herit. S. Angl. whose plant is probably Habranthus robustus, possibly Z. mesochloa. Leaves green, sometimes rather glaucous; tube very short, rounded within by the bending of the base of the filaments;

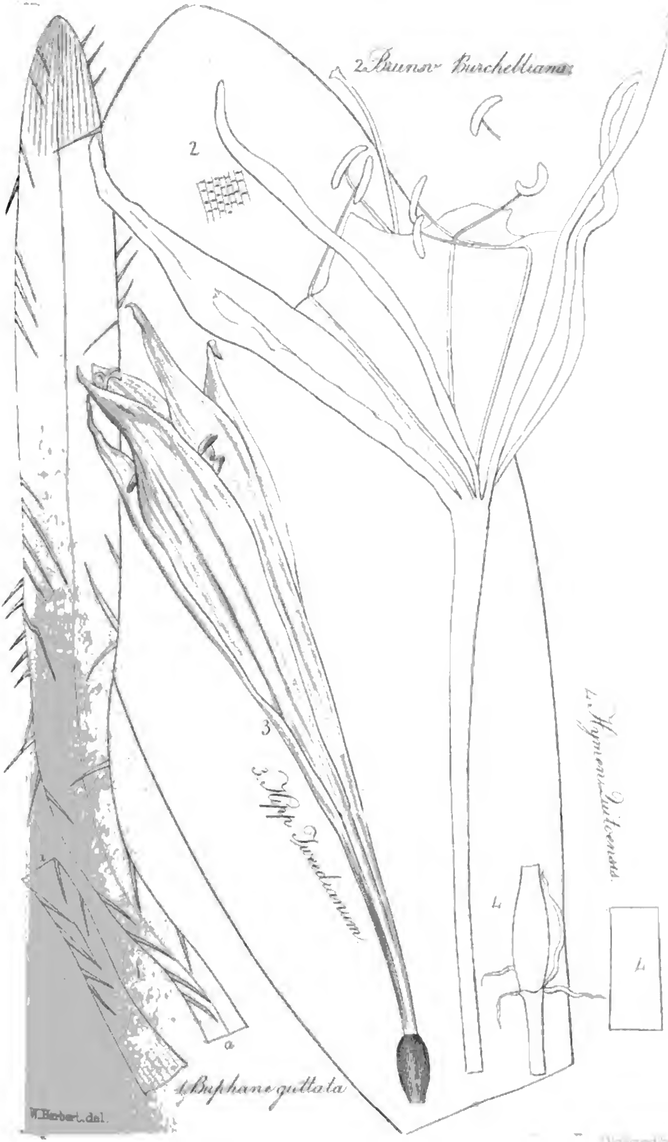
perianth white, green below. Native of the Blue mountains in Jamaica. The name Tubispatha having been now generally applied to this species, though certainly not L'Heritier's Bonarian plant, it is not advisable to disturb it. This is properly a stove plant, requiring a sandy soil, rest in the winter, and much water in the summer. Ripens seed freely.

Var. Hybrida.—Spofforthiæ. Spofforthiana. Bot. Reg. 21. 1746. A very pretty pink mule from Tubispatha impregnated by Carinata.

5. Nervósa.—H. and B. Kunth, 1. 285. Leaves linear, smooth, 10-11 inches long, scape 6-8; peduncle scarce longer than the spathe; perianth one inch and a half long, white, green below; filaments alternately equal; style longer. Six small processes near the insertion of the filaments, if I rightly understand Mr. Kunth. The addition that the seeds are bulbiform (Kunth), if thereby green fleshy seeds are meant, I have no hesitation in pronouncing to be quite erroneous, nor were the travellers likely to have seen both flower and seed. America produces no genus of that section.

6. Grácilis.—Pl. 29. f. 1. Specimina Ruiz ex Port. de S. Maria. Herb. Lamb. absque foliis. Scapo biunciali filiformi, pedunc. $\frac{3}{8}$ unc. spathâ $\frac{5}{8}$ unc. perianthio (albo?) semunciam excedente, stylo isometro filamentis longiore suberecto, stigmate minuto lobis brevibus. The specimens of this singular and diminutive plant are without leaves; the form of the flower is funnel-shaped with the points a little reflex. The stigma is less cleft than usual in this genus. Scape filiform two inches, peduncle $\frac{3}{8}$, spathe $\frac{5}{8}$, perianth half an inch (or a little more), seemingly white; style equal, longer than the filaments.

7. Mínima.—Pl. 24. f. 3. Specim. Tweedie; from Buenos Ayres. Herb. Hooker. Bulbo parvulo collo semunciali, foliis filiformibus, scapis pluribus 2-3-uncialibus, spathâ $\frac{3}{4}$ tubatâ apice divisâ, pedunculis $\frac{1}{4}$ uncialibus germine $\frac{1}{4}$, tubo $\frac{1}{8}$, limbo $\frac{3}{16}$-$\frac{5}{16}$ albo, sepalis extùs rubescentibus, stylo bre-

2. Brunsv. Burchelliana
2
1
3
3. Hipp. Iwedianum
4. Hymen. Dutoensis
4
4
a
1. Buphane guttata
W. Herbert. del.

viore. Leaves filiform, scape 2-3 inches, peduncles $\frac{1}{4}$, germen $\frac{1}{4}$, tube $\frac{1}{8}$, limb from 3 to 5-16ths, white, sepals red outside, style shorter than the limb, spathe slit at the point. This plant is still more minute than the former, and not funnel-shaped to the base in the dry specimen, but more tubular.

8. Carináta.—Bot. Mag. 52. 2594.—Zeph. grandiflora. Bot. Reg. 11. 992. quoad florem, non quoad folia et sem. Leaves 5-16ths wide, channelled, keeled, green, red at the base; spathe longer than the peduncle, slit partly on one side, tube green, $\frac{3}{4}$ long, limb rose-coloured, 2 inches long; anthers long, style white. From Mexico. Dr. Lindley has withdrawn the name Grandiflora, because the plate and description of Grandiflora in the Register appertains to this species as to the flower, and to Lindleyana as to the leaf and seed, through a mistake of the gardener. A most beautiful species flowering abundantly in the greenhouse (if kept quite dry in the winter) in light sandy loam. I have never seen it make any advance towards the formation of seed, though tried in various aspects and temperatures, but a mule as above stated has been obtained from its pollen.

9. Rósea.—Bot. Reg. 10. 821. Bot. Mag. 52. 2537. Leaves bright green, narrow, recumbent; flower much smaller than Carinata, segments rather obtuse, rose-coloured. Native of the mountains in Cuba; a greenhouse plant, but its flowering is promoted by heat in the summer.

Var. 2. Bifólia.—Lamark Enc. 1. 122. Poirret Enc. Sup. 1. 316. Leaves acute, usually two, one a foot, one four inches long (probably so only at the moment of flowering); scape a foot, as thick as a pen; limb an inch long; filaments shorter; stigma trifid. In the woods of St. Domingo and Cayenne. Bulb a little longer than a nut. They cite Plumier M. S. t. 3. f. 137. Plum. cat. 7. and Aubl. H. Guin. 304. No. 3. There appears nothing to distinguish it from Rosea but the alleged habit of the leaves, and a more robust scape. A native of Cuba would probably be found in St. Domingo. The leaves of Rosea are more numerous, so that bífolia would not do for the chief name.

10. Commersoniána.—Pl. 29. f. 3. Specim. Commerson. ex Monte Video. Herb. Linn. Soc. Am. Atamasco minor. Red. Lil. 454. Foliis angustis linearibus, scapo debili, spathâ pedunculo longiore, perianthio circiter pollicari roseo. Leaves narrow, scape slender, spathe longer than the peduncle, perianth about an inch long, rose-coloured. The native country of Redouté's plant is not known; it agrees with Commerson's specimen from Monte Video, and is sufficiently distinct from Atamasco, which is a native of North America. I understand that the plant is lost at Paris; it has never been in this country.

11. Lindleyána.—Pl. 35. f. 5. Grandiflora, Bot. Reg. 11. 902. quoad folia et semina, non quoad florem. Am. minuta? H. and B. Nov. gen. 1. 278. Kunth Syn. 1. 285. Bulbo parvulo, foliis linearibus, pedunculo semunciali, germine ¼, tubo viridi ½ unc. limbo pallidè roseo, ⅞ unc. aculeis sub lente sex minutissimis ad basin petalorum. This plant, a native of Mexico, is distinguished by its smaller size, pedunculated germen, and pale rose-coloured flowers, from Verecunda, which it otherwise closely resembles. It is the plant of which the leaves are represented and the seed described under the name Grandiflora, in consequence of the flower of Carinata having appeared before the leaves on its first importation, and the leaves added to the drawing at a later period from a bulb of this species by a mistake of the gardener. My plants of Lindleyana are from an offset taken by Dr. Lindley's hand from the plant of which he described the leaf and seed. If a pot of these bulbs, after remaining dry in the greenhouse all winter, be placed on a warm flue and watered in May, the flower buds will appear in a few hours. I believe this to be Humboldt's minuta, but it cannot be identified with certainty, and the smaller species since discovered make the name not desirable.

B. Sessile.

13. Séssilis. Foliis gracilibus semicylindricis viridibus, ortu tortilibus; germine sessili; tubo ultra semunciali, aculeis binis minutissimis ad petali cujusque basin; limbo albo, sepalis extus plus minus rubescentibus; scapo in seminando deflexo; stylo valdè deflexo.

Var. 1. Verecúnda. — Bot. Mag. 52. 2593. Germen above $\frac{1}{4}$, tube green $\frac{5}{8}$, limb $1\frac{1}{8}$ long, white, tinged with blush outside; sepaline filaments shorter, petaline just longer, than the style. 8/

Var. 2. Striáta.—Bot. Mag. 52. 2593. Sepals streaked outside with red; style longer than any of the filaments. This plant does not appear to maintain its distinguishing features with certainty when raised by seed.

Var. 3. Ackermánnia.—From Guatimalà. Leaves rather broader; sepals red externally before expansion; perianth internally pure white; style much longer than in either of the other varieties. It does not flower near so freely as them, and is more disposed to make offsets. These plants require no trouble, but to keep them dry in winter; they may be crowded in a small pot, stowed away any where dry, and set out of doors in May or June, when they will flower immediately; or they may be kept in dry sand, and planted out in May in a border of sandy soil. Their flowers expand quite flat when the sun shines, and are produced abundantly, and every flower is followed by a seed-pod. The seedlings flower at an early age.

14. Grahamiána.—Pl. 29. f. 2. Specim. Graham 358. B. Herb. Lindl. Mexico. absque foliis. Scapo triunciali, spathâ $1\frac{3}{16}$ dimidio tubulosâ, basi inflatâ superne bifidâ (vel fenestratâ?) germine sessili $\frac{1}{4}$ unc. perianth $1\frac{7}{8}$, tubo gracillimo $\frac{7}{8}$ unc. limbo unc. laciniis ovalibus ultra $\frac{3}{8}$ latis (in spec. sicco pallidè purpureis infra lutescentibus) filamentis $\frac{3}{8}$ unc. liberis, stylo suberecto tubum $\frac{3}{16}$ superante, stigmate lobis obtusis, antheris limbo semunciam brevioribus. This plant is nearly allied to sessilis. The flower is more purpurascent, the tube rather

longer, and the stigma less trifid. The leaves are wanting to the specimen.

Obs. The genus Zephyranthes, requiring rest in winter, may be kept dry at that season, and planted out in the full sun in very sandy soil in the spring.

§. 2. Antheris subulato-tortilibus, erectis apice reflexo; polline difformi; stigmate obtusiore, lobis sub-erectis. Genus diversum? Argyrópsis.

1. Cándida.—Bot. Mag. 53. 2607. Am. candida. Bot. Reg. 9. 724.

Var. 1. Flore majore. — Specim. Herb. Hooker. Matthews, 434. ex hortis veteribus per Limæ vallems.

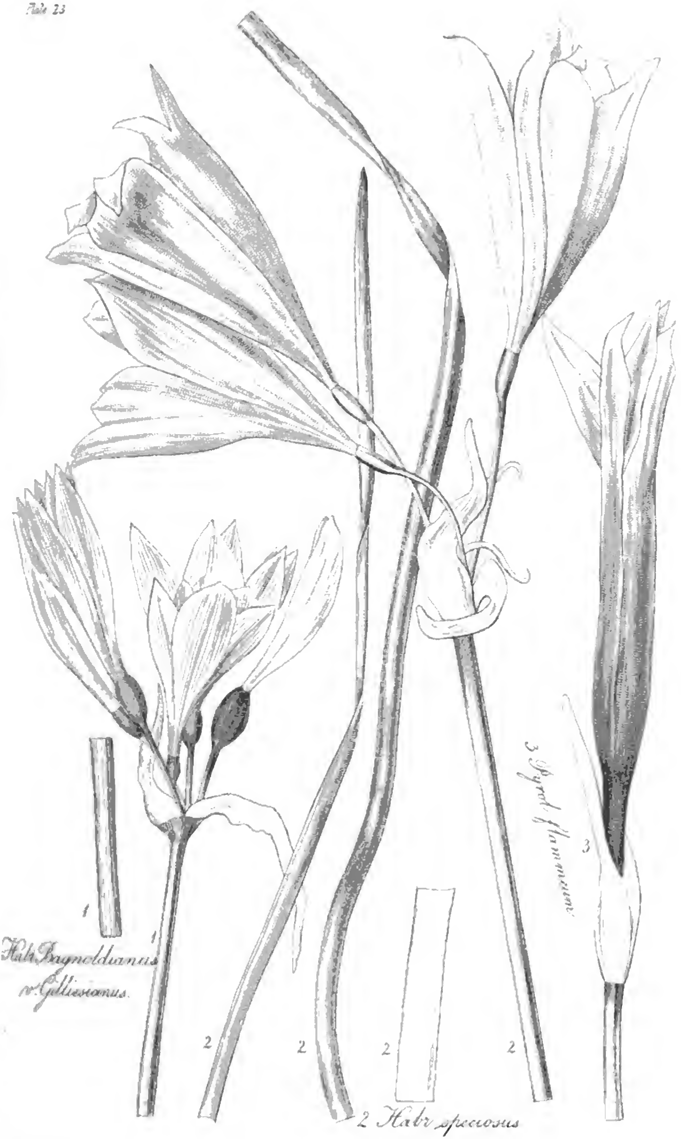
Var. 2. Flore minore.—Pl. 24. f. 2. Specim. Tweedie ex ripâ fluminis *La Plata,* ita ab argenteo plantæ hujusce floridissimæ aspectu nuncupati. Herb. Hooker.

Var. 3. Rubro extus suffusa. — From Buenos Ayres. Reddish outside.

Var. 4. Fortuíta.—Quadriloculáris. Ex Bonariâ. Perianthii segmentis et staminibus octo, stigmatis lobis et capsulæ loculis quatuor; scapo pedali; flore majusculo.

This plant, conspicuous by its fleshy, semicylindrical and rush-like leaves, which resist the severest frost of our usual winters, has ripened its seeds with me after snow had lain upon them for three weeks. I have seen the quicksilver fifteen degrees below the freezing point (Fahren.) without its losing more than the ends of its leaves. I have not been able to ascertain that it is indigenous in the west of South America, though abundant in old gardens in the valley of Lima. There is no difference in the hardiness of the constitution of the bulbs from Lima and those from Buenos Ayres, where the banks of the Plata are so covered with it that it is understood that the river was called La Plata, meaning silver, on account of the profusion of its white blossom on the shore. I have had seventy flowers expanded at once on a small patch of the plant at Spofforth. It is strange that this plant, which thrives in the hot valley of Lima, should have stood out of doors here nine or ten years unprotected, without ever losing its leaves entirely. Perhaps the strong current of air which must accompany the rush of such a great

Plate 23



Herbert del.

body of water as the Plata, and the evaporation from it, occasions a degree of cold on its immediate banks which the latitude would not otherwise admit. There is, however, a mystery in the constitution of plants, which does not always depend upon their native climate. I raised two species of Gesneria from accidental seeds lodging amongst the roots of the same plant of Pitcairnia, plucked off a rock in Brazil, one of which objected to the heat of a stove, and the other could not live through the winter without it. Candida flowers abundantly here under a warm south wall, upon the first autumnal rains after a season of drought, which does not however at all affect its foliage; and, if they cease, its blossoming will be suspended, unless it be watered, and recommence later. I have an extraordinary variety (var. 4.) from Buenos Ayres, which flowers year after year with eight segments to the flower, eight stamens, four lobes to the style, and four cells to the capsule. It has a more robust scape a foot high, and very conspicuous large flowers, expanding full three inches. I have seen accidental flowers of Gladioli with a supernumerary stamen, sepal, and petal, and even with two, and a regular fertile four-celled capsule on Camellia Japonica, but this is the only instance I have observed of a seedling with such a variation permanent. My belief is that this plant belongs to a genus intermediate between Zephyranthes and Cooperia, though I will not disturb it till the further species of those genera can be thoroughly examined. It differs from Zephyranthes, and agrees with Cooperia in having deformed pollen, a point which I am persuaded must indicate generic diversity, though we may be sure that the diversity, if positive, would not be confined to such a secret feature. It differs from Zephyranthes in the stamen, and from the known Cooperias in the absence of a cylindrical tube and in its expansion under sunshine; from both in the substance of the leaf and their permanency. The erect lobes of its stigma are peculiar to itself; and it has as yet resisted my repeated attempts to cross it with Zephyranthes. I suggest the name Argyropsis, if its separation should be established on further investigation, in allusion to its silvering the banks of its native river, and giving name to the Argentine republic. It comes very near, however, to Z. sessilis, which forms a link between it and the pedunculated species, and I can only separate it as a section of that genus.

I learnt from my lamented friend, Dr. Carey, that the species of Zephyranthes which I had sent to him had multiplied prodigiously in the East Indies, as well as the Hippeastra, the former being a substitute for our crocuses, the latter for our tulips, in a tropical garden; and he was earnest in his application for every species of Zephyranthes.

There is a little mystery in the expansion of Candida. I have seen it open quite flat in warm sunshine, but I have, nevertheless, in very cold gloomy weather with a north wind, seen its flowers standing at 3-4ths expansion at night, and a few days after, when the wind was south-west and warmer the flowers were not near so open even in the day; as if its expansion depended on the dryness of the atmosphere.

36. Coopéria.—Germen erect; tube erect, long, slender, cylindrical, widened at the mouth; limb in its prime stellate; filaments inserted at the mouth, nearly equal, erect; anthers erect, affixed at one-third from the base, not versatile, fasciculate; style erect. (Stigma three-lobed, fimbriated, viscous; lobes furrowed, obtuse; leaves linear, tortuous; scape one-flowered; spathe one-valved.)

1. Drummondiána.—Pl. 24. f. 2. 5—11. Pl. 41. f. 16. Drummondi, Bot. Reg. 22. 1835. Var. 2.—Chlorosólen.—Pl. 24. f. 1. Bot. Mag. 63. 2482.

Leaves 1-12th to 1-8th wide, 12-18 inches long, tortuous, green, tending to glaucous; scape 4-13 inches; spathe about 1½, slit or looped at the end; tube 4¼ inches, greenish, often fading red; limb 1⅛ long, white, acquiring often six broad red stripes on the back in fading; sepals tipped on the back with green: style sometimes shorter than the tube, sometimes exceeding the stamens; filaments free, about ⅛ of an inch; flower expanding in the evening, sometimes beginning to close a little in the morning, sometimes lasting four days before it withers.

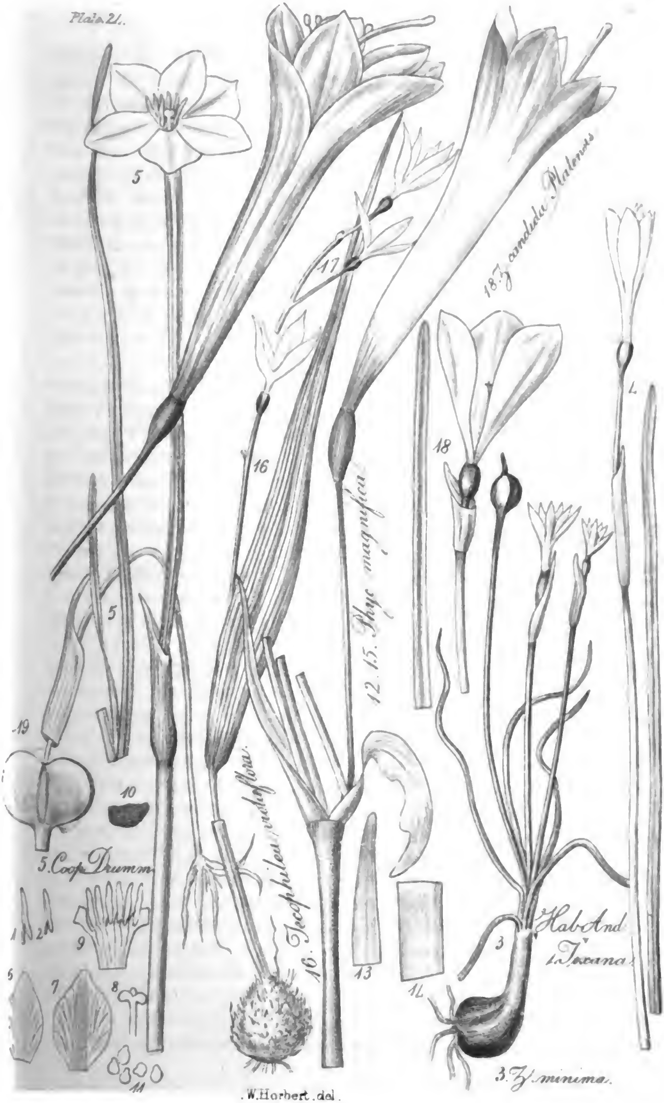
This plant is so variable, that three bulbs sent by Drummond separately, and perhaps from different localities, flowered at Spofforth, one with the style shorter than the tube, one longer, but shorter than the stamens, and the third longer than the stamens; the difference of stature and colour was also considerable, but the first of the three bulbs having produced, in the space of six months, five successive scapes, has itself exhibited successively all the diversities which were at first supposed to distinguish the three bulbs, and it is vain to separate them. The flower always expands in the evening, and is not usually seen in its perfect state after the first night, the perianth becoming less stellate and the margins of the segments curled, but it endures for three or four days in that state. The bulb figured in the Bot. Reg. having produced a scape in August, when the weather was very fine and hot, was placed out of doors in the full sun. It expanded as usual in the evening, and in its prime the limb was pure white; the next morning it had become less stellate, and it lasted so four days, at the end of which, as it began to wither, the tube became red, and a deep broad red stripe appeared on the back of each segment, widest on the sepals. The nocturnal flowering of this plant is an anomaly in the order, and the more remarkable, because its nearest kin, Zephyranthes, requires a powerful sun to make it expand. The flower is fragrant, smelling somewhat like a primrose. I have the bulbs in a sandy compost, which clearly suits them. They do not seem impatient of either heat or cold, but like a free supply of water; as soon as the seed on one scape is ripe, another seems ready to rise. The flower has no irritability, and does not seem affected by the presence or absence of sun after it has once expanded. A single flower is not very conspicuous, but in a tuft they would be very ornamental. Severe frosts occur in Texas, and it may perhaps prove hardy; but its habit appears to be to flower successively from the earliest spring till September, the leaves growing principally late in the autumn, and in the winter if protected.

2. Pedunculáta.—Pl. 42. f. 3, 4, 5. Sceptranthes Drummondi. Graham. Edin. phil. Jour. 40. 413. 1836. Zephyranthes Drummondi. Don. Sweet, Brit. fl. g. ser. 2. 328. Nocte patens, fragrans; bulbo depresso, foliis glaucis subsesquipedalibus ¼ unc. latis subobtusis, scapo superne attenuato unifloro, spathâ 1⅝, apice semunc. bifidâ, pedunculo ⅝-1 unciali, perianthio 2⅛-2½ unciali albo, limbo 1¼ vel ultra, antheras unciam superante, tubo 1-1¼ unc. antheris ¼ uncialibus, petalinis sepalina vix quartâ parte superantibus, stylo ⅝ unciali erecto, stigmate suberecto incluso. Bulb black, flattened at top, about

$1\frac{5}{8}$ diameter; leaves glaucous, $\frac{1}{4}$ of an inch broad, near $\frac{1}{2}$ an inch close to the bulb, scape 8 inches high, $\frac{1}{4}$ diameter; peduncle an inch; spathe bifid at the end, at first covering the germen, afterwards disclosing it on one side; flower 2 inches and $\frac{1}{8}$ or more, tube about an inch, limb white, tinged with pale blush in the bud, white when blown, striped outside with red in withering, an inch longer than the anthers; anthers $\frac{1}{4}$ of an inch long, the petaline scarcely exceeding the sepaline in position by a quarter of their length; style $\frac{5}{8}$ of an inch long, or shorter, erect; stigma suberect, included in the tube; capsule three-furrowed, $\frac{5}{8}$ths long, $\frac{3}{4}$ wide, not widened at bottom.

This is another of Drummond's bulbs, which has flowered at Dr. Neill's, in the Edinburgh and Glasgow Gardens, and at Spofforth. It was not observed during the night in Scotland, nor seen to expand perfectly. It did not flower at Spofforth till the 20th of September, the weather being then very cold and cloudy. The scape and spathe were pale reddish, the bud tinged with a faint blush. A little before sunset it expanded a little, the limb having grown pure white; in that posture it remained till the same hour the next evening, when it opened a little wider, and on the third evening it made a fresh effort and reached a state of about half expansion; the next morning the sepals acquired a red tinge on the outside, and the flower began to shrivel. It had the same primrose-like fragrance as Drummondiana. The petaline filaments were prolonged a little, adhering to the base of the petals; the style in my specimen was only half the length of the tube. The tube was quite as erect and cylindrical as in Drummondiana, the figure in Sweet's Br. fl. g. being very incorrect in that respect. I was at a loss to understand the capricious non-expansion of these nocturnal flowers, but I am convinced that it arises from the manner in which they have been treated. Increase of temperature prevents their expansion, and probably would obstruct the opening of any night-blowing flower. The requisite for producing the flower is a certain mean temperature, but a gradual decrease of temperature, such as usually takes place at sunset, is necessary for its expansion. Therefore if the plant be in a stove or warm greenhouse, and the weather cold and cloudy, there is no decrease of temperature at even,

Plate 21.



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but perhaps an increase on shutting the lights and making up the fire; and so circumstanced the flower of the Cooperias obstinately refuses to open. If placed in the open air the day before the flower is to blow, it feels the natural evening refrigeration and expands like a star, and having once attained that posture it preserves it till it withers, that is about three days. The first day my C. pedunculata tried to open it had been very cold and gloomy, and where it stood there could have been very little decrease of temperature at night; on the two following days the weather became gradually warmer, so that it felt a little more diminution of warmth each evening, and consequently opened a little more, but the change was never great enough where it stood to cause a perfect expansion. The natural effect arising from decrease of temperature may be counteracted in like manner by the artificial treatment of animals. The African Whidah bird acquires fine plumage and a prodigious tail at its vernal moult; at the approach of winter it puts on brown feathers and a short tail; but if during the summer it is kept in a cold, sunless, and airy situation, and just before its autumnal moult is brought into a close and heated room, it will acquire a renewal of its summer dress; and under such treatment it will never put on its winter plumage. I can entertain no doubt as to the generic identity of this plant and Drummondiana.

Professor Don looked upon it as a Zephyranthes, not having seen the live specimen, and relying on the engraving in Sweet's Br. fl. g. from a drawing by Mr. M'Nab; but the engraving is very incorrect in the form and posture of the tube. The outline I have given is from a drawing also by Mr. M'Nab, which was communicated by Dr. Graham to Sir W. Hooker, and kindly forwarded by him to me, together with the dry specimen of the flower received from Dr. Graham. In that drawing, which is correct, and of which the outline had been sent to the engraver before the bulb flowered at Spofforth, the flower has exactly the form and posture of Cooperia, and the only difference of structure is a very trifling increase in the prolongation of the petaline stamens, which are, however, only 1-16th of an inch longer than the sepaline. If Mr. Don had seen the live specimen or Mr. M'Nab's drawing, he would have entertained a different opinion concerning this plant. Dr. Graham named it Sceptranthes, considering that its less expanded limb, its shorter tube, and pedunculated germen, distinguished it from Cooperia. The expansion of C. Drummondiana depends as much on the decrease of temperature; and I had one flower of it in the winter that never opened at all, though it ripened its seed. The comparative shortness of the tube can be only looked upon as a specific feature; witness the great difference of its length in Hipp. breviflorum and solandriflorum, Hymen. Caribbea and pedalis; the pedunculated and sessile germen occur together in the most nearly allied genus Zephyranthes, as well as in Ismene and in Hymenocallis; and I can discover no feature of sufficient weight to separate it generically from Drummondiana. I am indebted to Dr. Neill for seeds ripened in his collection, and an excellent sketch of the bulb with the scape and capsule, which is not enlarged at bottom, as usual in Zephyranthes. The seeds are like those of Drummondiana, flat and black. They vegetate readily. The leaves of Drummondiana have a glaucous tendency, which perhaps is common to the whole genus.

Species dubia, flore nondum viso.— Doubtful species.

3? Mexicána.—Bulbo depresso, foliis glaucis, canaliculatis, sesquipedalibus, tortuosis, recumbentibus, $\frac{3}{16}$ uncial. latis subobtusis. Bulb flattened at the top; leaves glaucous, channelled, a foot and a half long, tortuous, recumbent, 3-16ths of an inch wide, rather obtuse. Imported by Mr. Loddiges from Mexico. I have not yet succeeded in obtaining a flower from it, nor has it blossomed at Hackney, where Mr. Loddiges has many bulbs of it in a thriving state, but I think it will prove to be a white Cooperia. It has the same flattened summit to the bulb as C. pedunculata. I suspect the cause of its not flowering to have been the cessation of watering at the approach of winter, and consequent delay of the growth of its leaves till the spring. It is now making great growth of leaves in September, and I doubt not that by encouraging them in the winter it will be induced to flower in the spring or summer.

37. Haylóckia.—Leaves linear; scape concealed, one-flowered; spathe one-valved, half-concealed, divided upwards; germen concealed in the bulb; tube cylindrical, enlarged at the mouth, limb funnel-

shaped below, semipatent upwards; filaments of alternate length, conniving, inserted in the segments of the limb, the sepaline at their base, the petaline higher; anthers incumbent, versatile, attached in the middle; style erect; stigma deeply trifid, erect, with recurved points, concealed in the tube; capsule protruded on a short peduncle, round, 3-furrowed, 3-valved; seeds with a rounded back.

1. Pusílla.—Bot. Reg. 16. 1371.—Sternebergia Americana. Hoffmansegg. verz. pfl. p 197. cum fig. Berl. 1824.—Var. 2. Rubélla.—Hoffmansegg, ib. Variety with pink flowers.—Bulb small, leaves hiemal, very narrow; flower autumnal after a season of drought, tube an inch, limb an inch and $\frac{1}{8}$, white tending to straw-coloured, stained with purple without; style white. Hoffmansegg states that the plant is abundant at Maldonado, and that it is found red as well as straw-coloured. The flower has some affinity to the European Sternebergia, but it belongs to a different section of the order. The seed of Haylockia approaches to that of Zephyranthes, with which it is closely connected.

38. Pyrolírion.—Leaves attenuated at both ends; scape one-flowered; germen sessile; tube cylindrical, erect; limb campanulate with reflex points; filaments equal or alternately equal, suberect, patent; anthers versatile; style erect or reclining? stigma trifid.

1. Aúreum.—Pl. 29. fig. 4. Spec. 400. Herb. Lindl. Pl. 23. fig. 3. Spec. Dombey Herb. Soc. Linn. A. aurea. Flor. Per. 3. 56. 286. A. tubiflora, L'Her. S. A. 10. Lil. Narc. Feuill. Obs. 3. 29. 26. A. Peruviana. Ker. Lamark. Bulb beset with blind offsets, scape a foot high, flower 4-4¼ inches long, golden, mouth of the tube scaled; style scarcely exceeding the filaments. Dombey's specimen, which is L'Heritier's plant from Lima, has the flower more than four inches long. The peduncles in the plate of Flor. Per. are false, and not mentioned in the description. It flowers in January and February in the cornfields of Peru at Lurin,

Surco, Magdalena, Lurizancho, and Chorillo, near Lima; called Hamanco de Antibo.

2. Flámmeum.—Flor. Per. 3. 56. 286. Lilio-narc. mon. coccin. Feuill. Obs. 3. 29. 21. Flower shorter, limb only two inches, fiery orange, faucial scales short, truncate, and crenate. In the cornfields of Chancay, near Huaura, and in the fields and on the hills of Conception in Chili.

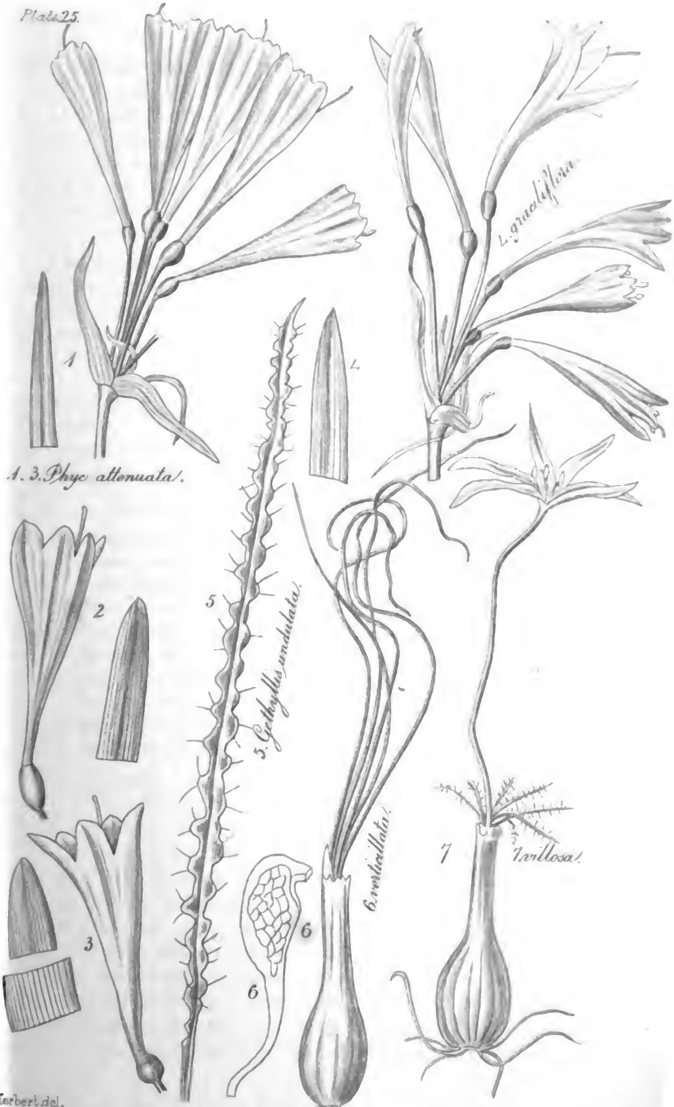
3. Flávum.—Spec. Ruiz. Herb. Lamb.—Pyrol. aureum, fauce lævi. Bot. Reg. 20. 1724. Scape short; flower 3 inches or less, pale golden; tube smooth; filaments much shorter than the style; stigma deeply trifid.

There is a specimen from Peru with the scape shorter than the flower, which is decidedly flavum; two other specimens of aureum are erroneously marked flavum. These three plants are very nearly allied, but as Ruiz distinctly describes the faucial scales of aureum and flammeum, the plant in which Dr. Lindley found none, must be the third species which Ruiz named, but did not describe. It also agrees with it and differs from aureum in the short scape, long style, and paler colour; and disagrees with aureum in not having the circle of blind offsets described by Ruiz, which I find in an imported bulb of Pyrolirion, which has not flowered. The figures in the Flor. Per. are quite unworthy of faith, but the descriptions of Ruiz appear to me singularly correct. The three species are probably distinct; aureum with larger golden flower, style little exceeding the filaments, and faucial scales longer; flammeum with smaller flowers, fiery orange, and crenate scales; and flammeum with paler flowers, longer style, and short scape. The filaments of flavum in Mr. Lambert's specimen are as nearly equal as possible.

Species dubia.—Doubtful species.

4? A'lbicans.—Lil. Narc. monanthus flore albicante, tubo prælongo. Feuillet Obs. 3. 29. f. 20. Scapo tereti, virente, 8-unc. tubo 2-unc. 1½ lin. lato; limbo circiter 2-unc. laciniis acutis apice reflexo; foliis 7-8-unc. 1½ lineas latis, viridibus, acutis, canaliculatis. In valle Ylo intra montes Peruviæ, situ aridissimo. This plant, from Ylo in Peru, is

Plate 25.



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only known to us by Feuillet's description and bad plate, with a whitish tubular flower, and limb reflex at the point; it agrees with no genus but Pyrolirion. There is no spathe in the figure. It is impossible to be quite certain that this plant may not be a Cooperia; but both the leaves and reflex points of the limb seem to correspond with those of Pyrolirion.

I have not possessed this genus long enough to be sure of its habits. It flowers before the full growth of the leaves in S. America in January and February, that is at and after midsummer, therefore the leafing of the plant is autumnal. As it had had leaves all the last summer at Spofforth, I left it dry through the winter and started it in the spring; but, as it appears disposed to push more leaves this year in September, I apprehend that its proper season of rest will be the spring and fore-part of the summer.

§. 3. Oporanthiformes.—Scape solid; filaments free. [Seeds testaceous?]

39. Gethýllis.—Bulb ovate, coats often imperfect; leaves linear; scape and germen concealed in the bulb; tube cylindrical, long, adhering to the lower part of the style; limb regular, patent; filaments short, straight, diverging, sometimes by superfluity doubled or trebled, or multiplied numerously, inserted at the mouth of the tube; anthers erect, attached at the base; style erect; stigma simple or triangular; capsule with the scape extended, diaphanous, pulpy; seeds small, round. *S. African plants.*

1. Spirális.—Bot. Mag. 27. 1088. with minute and excellent particulars of the genus and species by Mr. Ker. Papiria. Thunberg. Act. Phys. 1. 2. 111. Leaves narrow, smooth, a little spiral; tube white, near 3 inches long, limb 1½, white, purplish without; filaments six.
2. Ciliáris.—Jacq. Schœn. 1. 79. Leaves narrow, ciliated; tube cylindrical, widened near the base; limb white, patent; filaments six, with three anthers on each, stigma obtuse. Flowers before the leaves.
3. A'fra.—Bot. Reg. 12. 1016.—Leaves narrow, smooth, spotted; tube purple, 2 inches long, thicker than

in spiralis; limb white within, purplish without; anthers large, 10-12; style longer than filaments; stigma triangular, almost 3-lobed. Flowers sweet.

4. Villósa.—Pl. 25. fig. 7. Specim. Masson. Herb. Banks. Papiria villosa. Thunberg. act. 1. 2. 111. Bulb ovate, small, with a cylindrical neck; leaves very villous and narrow; tube slender, near 3 inches long; limb white, about ⅞, filaments and anthers six, 3 shorter.

5. Verticilláta.—Pl. 25. fig. 6. Specim. Masson Herb. Banks. absque flore. Vide Brown prod. 290. Bulbo parvulo ovato, foliis quinque filiformibus; fructu ovali unciali; scapo unciali. Bulb small, oblong, ovate; leaves five, like threads, 4 inches long; fruit an inch long on a scape an inch long. I know nothing of its flower.

6. Unduláta.—Pl. 25. fig. 5. Specim. Masson Herb. Banks. absque flore. Bulbo oblongo ovato, 1¼ unc. lato, collo foliis sub terrâ vaginantibus producto 5-unciali; foliis 20, 7-uncialibus, erectis, undulatissimis, setosè ciliatis. This singular plant, with leaves undulated extremely and in a most remarkable manner, and ciliated with strong bristles, is only known by Masson's specimen, with no account of the flower, which, perhaps, he never saw. It is the largest known species.

7? Lanceoláta.—Thunb. act. 1. 2. 111. cum fig. Bulb small, ovate; leaves smooth, of the length of the flower. On the hills near Buffalo river and elsewhere. Mr. Ker refers this plant to Curculigo. I have not been able to obtain a sight of Thunberg's figure.

8? Rósea.—Ecklon topogr. verz. 4. Flowers rose-coloured; of smaller stature than the rest. At the foot of Bavian's-berg, near Gnadenthal. I know nothing further of this plant.

40. **Sternebérgia.**—Bulb ovate; leaves linear, following the flower; germen subterraneous; scape autumnal, one-flowered; tube erect, cylindrical; limb semipatent; filaments filiform, dilated at the base, conniving, alternately longer; anthers short, oblong,

versatile; style thicker upwards; stigma 3-lobed; seeds black, shining, dotted, with a thick white spungy cord.

1. Colchiciflóra.—Kit. et Wald. 2. 157. M. v. Bieberstein, 1. 261. Flor. Græc. Narcissus autumn. Clus. 2. 164. Specim. Herb. Lindl. Bulb small, leaves erect, keeled, tortuous, blunt, about a line wide; flower autumnal, yellow, sweet; tube long, limb shorter. Native of Hungary and Tauris. Seed ripe in June; capsule spherical. Called in Thrace Ciden Sair.

Var. 2. Dalmática.—Humilior flore minore lætè flavo, laciniis angustioribus tubum subæquantibus, stylo stamina excedente. In Dalmatiâ prope Czerno. Reichenb. Fl. Germ. p. 87. Variety of lower growth, with a smaller bright yellow flower, segments narrow, nearly as long as the tube; the style longer than the stamens. Found by Reichenbach near Czerno in Dalmatia.

2. Clusiána.—Ker. Narcissus Persicus. Clus. 2. 163. Leaves lorate, tortuous, glaucous, erect; flower autumnal, pale yellow, stinking; sepals wider. Sent to Clusius from Constantinople.

3. Cítrina.—Flor. Græc. 4. 311. Limb about an inch long or more, pale yellow, segments narrow; tube above an inch, style 1¼, a little exceeding the longer stamens; stigma trifid, lobes recurved; leaves erect, a little tortuous. Flowers late in the autumn on Mount Olon in the Morea.

4? Ætnénsis.—Rafinesque Schmatz Caratteri. p. 84. t. 18. f. 2. Am. Ætn. Filaments said to be equal, probably inaccurately; otherwise scarcely to be distinguished from Citrina. Leaves linear, acute, spiral; spathe acute, subulate, of the length of the germen; scape shorter than the flower; perianth (probably meaning limb) an inch long, erect, campanulate; segments oblong, obtuse, pale yellow; filaments filiform, anthers very small, round; stigma 3-lobed. Amongst the fern in the woods of Mount Ætna, near Nicolosi. The tube is not mentioned.

Caucasica.—Willd. is a misquotation from Marsh. von

Bieberstein, referable to Merendera Caucasica. Sternebergia Colchiciflora has been introduced into this country lately from Hungary by the Hon. W. Fox Strangways, with whom it has flowered.

41. **Oporánthus.**—Bulb roundish; leaves hiemal; scape autumnal, one-flowered; spathe tubular, divided at the point; germen erect; tube short, erect, tending to funnel-shaped; limb regular; filaments inserted in the tube below the limb, decurrent, conniving; anthers versatile; stigma trifid; ovules roundish, irregularly angular by compression. Seeds nowhere described.

1. Lúteus.—Am. lutea. Bot. Mag. 2. t. 290. Redouté lil. 148. Narcissus autumnalis major. Clus. 2. 164. Mountain pastures in Spain, Italy, and Greece.

Var. flore pleno. Hill's Eden.

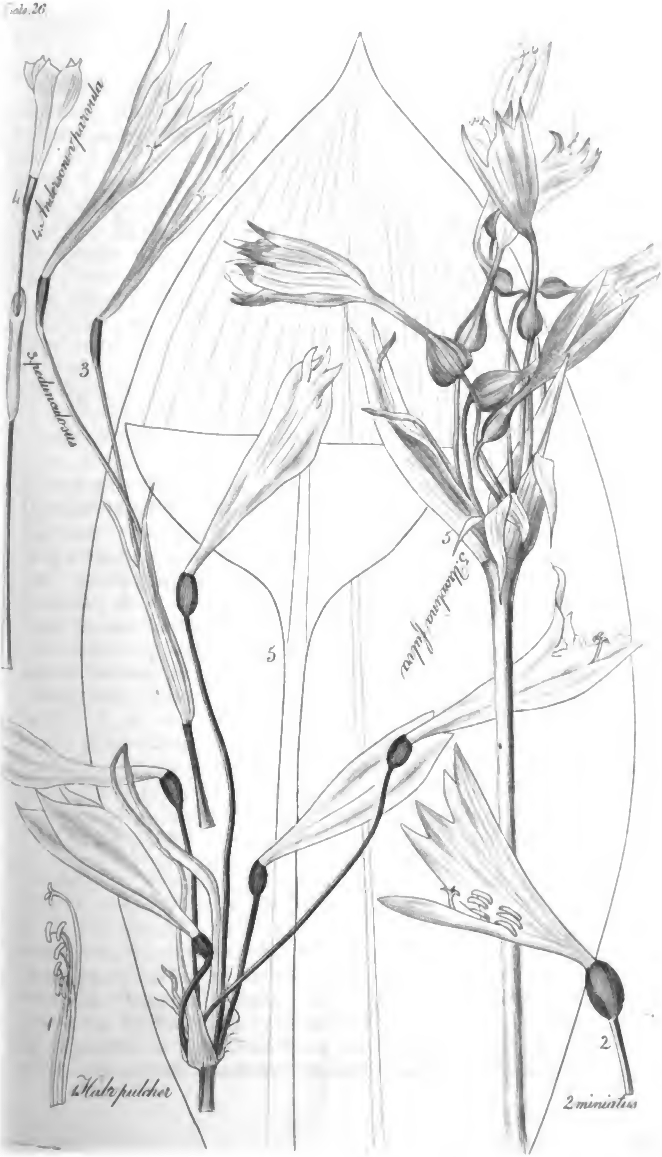
It is very strange that no writer has described the seed of this plant, which is much cultivated, nor have I ever seen it. Hill speaks of sowing the seed in beds, as if he had readily obtained it, and asserts that the seedlings vary much in the shade of yellow, and he gives a figure of a double variety which is probably lost. That the seed is roundish and black I entertain no doubt. The only variation I have seen is a narrower and a broader leaf. This plant is hardy, but the bulbs often rot with me in the open ground if the summer is wet. Probably they should be taken up and dried when the leaf decays.

2. Exíguus.—Amaryllis. Schousboe Morocco, 1. 160. Scape an inch high; leaves 1-3, short; tube short, limb campanulate, yellow; segments equal, obtuse, with a deeper yellow midrib; filaments nearly as long as the limb; style filiform. Tangiers.

42. **Lapiédra.**—Perianth regular, expanded, star-shaped; filaments straight, erect; anthers arrow-headed (incumbent?); seeds small, angular. Pl. 42. f. 10. 11.

1. Placíana.—Sparganium Plaçæ. Clus. Pl. rar. 164. Lapiedra Martinezii. *Lagasca Nov. sp. et gen.* p. 14. Crinum Martinezii, ib. Barrelius, ic. 993. A.D. 1714. Flowers about eight, white; style and stigma white, spathe 2-3 leaved; leaves (two only?) longitudinally striped with white, linear, obtuse.

Tab. 26


4
4. Andersonii parvula
3. pedunculosus
3
5
5. [illegible] fulva
5
1
1. Habr. pulcher
2
2 miniatus

It is very remarkable that this plant should have been described above 200 years ago by Clusius, with particulars concerning it which as yet we only know from his report, and with a precise indication of the spot in which it still grows spontaneously, and that no botanist, as far as I can perceive, has since noticed his account of the plant under the name Sparganium Plaçæ, by which it is indicated on the margin of the page in which it is described. He states that it was pointed out to him in its native locality, on the stony heights above Valentia, by Dr. Plaça, a physician of that town; and in that very spot it is still pointed out by Lagasca, as growing amongst the clefts of rocks, without any reference to Clusius. It is difficult to understand, even in the vague state of botany at that period, how Dr. Plaça should have looked upon it to be a Sparganium, which is an ancient name for a genus of a very different family, but there is no reason for rejecting the specific name which Clusius gave to it in commemoration of its first discoverer. It seems to have been rather overlooked than intentionally laid aside, and as the later name has had little currency I have thought it undoubtedly proper to restore the original one. According to Clusius it usually has two leaves, in form like those of Oporanthus luteus, but marked with a longitudinal white stripe. He states the seeds, which are not noticed by Lagasca, to be small and angular. I conjecture the scape to be solid, and the seeds testaceous. It is strange that Spanish plants of such easy access, and whose locality is so well known, as Lapiedra and Tapeinanthus, should never have been brought into cultivation, nor specimens even introduced into any herbarium. Lapiedra appears to be one of the points by which Amaryllideæ approach the hypogynous Allium and Ornithogalum. If the seeds, contrary to my expectation, should prove to be fleshy, which I think very improbable, the genus would properly follow Carpolyza. According to Lagasca it grows also near the church of San Fuen, near Algesiras, and near Malaga, and it might certainly be easily obtained. The anthers are asserted to be arrow-headed and incumbent; with the form of an arrow-head I should have expected them rather to be erect, like those of Hypoxis. The plant having been called a Crinum, I assume it to be schistandrous; it may, however, prove to be porandrous, it which case it would stand amongst Galantheæ, probably next to Leucojum.

§ 4. PANCRATIFORMES.—Cup staminiferous.

‡ *Seeds black, shelly.*

43. TAPEÍNANTHUS.—Perianth with ovate-oblong segments, short cup, filaments long and diverging, anthers short and incumbent, style erect with an obtuse stigma; scape rising before the leaves.—N. B. Spathe is said to be one-leaved; bulb small and pear-shaped.

1. Húmilis.—Pancratium humile. Cavanilles icones. This curious little Spanish plant is only known by the representation and description given by Cavanilles. It has a short scape rising in the autumn before the leaves, bearing two yellow flowers; the leaves are two, and extremely slender. The style is probably club-shaped. This plant, which is a native of the territory of Seville, appears to furnish a link between Oporanthus and Pancratium, one of those lateral connections which falsify continuous arrangements. The tube of the flower is perhaps little more than an annular connexion of the limb at the base of the inconspicuous cup, but it is not particularly described. Its separation from all the other genera of this section is evident; the staminiferous cup distinguishes it from all the other sections. It is much to be wished that some person, who has the means, would interest himself to procure the bulbs from Seville.

44. CHLIDÁNTHUS.—Tube erect, cylindrical, triangular, widened at the mouth; limb nearly equal, semipatent; filaments very short, curved, inserted in the points of the alternately unequal teeth of a thin membrane adhering completely to the tube and base of the petals, but partible; anthers attached near the base; style erect. (Germen erect, oblong, triangular; stigma trifid, patent; leaves linear-lorate, sheathing at the base; umbel few-flowered.)

1. Frágrans.—Pl. 27. f. 2. Herb. App. 46. Bot. Reg. 8. 640. Lindl. Coll. 34. Leaves about a quarter of an inch wide, glaucous, erect; flowers yellow, fragrant; germen subsessile; tube about two inches, limb 1½ or more; style longer than filaments, shorter than limb; stigma widely trifid; ovules

22 or more in each cell, opaque, flattened, heaped in two rows, scarcely lapping; [scape very flat, with winged furrowed margins]. Fruit not seen.

This plant was named and first described by me in the Appendix; and shortly after was represented and described by Professor Lindley, who discovered a slight membranous connexion of the base of the filaments, and irregular half-abortive dentate wings to the shorter or sepaline filaments, which I did not perceive in the specimen on which I founded the genus; but it had travelled 260 miles, from Highclere, and was a little withered, and the stigma had, as it appeared afterwards, been disfigured so as to appear obtuse. I have since re-examined it, expecting from its solid scape, that, being an occidental plant, it must appertain to the genera with a membranous cup. I find a fine six-toothed membrane, in which the filaments are inserted, adhering to the tube and lower part of the petals, the petaline teeth being prolonged. This membrane while the flower is fresh is partible, separating from the perianth like acuminate wings to the decurrent filaments, by taking hold of the point of the filament and pulling it. Those points are very short and ultimately curved. Here, therefore, we have the connecting link by which the solid-scaped shell-seeded Amaryllideæ without cup, like Oporanthus, come in contact with the Pancratiform section; the membrane in Chlidanthus being an imperfect or rather incipient manifestation of a cup. It brings Chlidanthus nearer to Clinanthus, in which, both from the appearance of the specimens and from the name Pancratium given to it by Ruiz, I judge the membranous teeth to be free from the perianth, and, unless I have been deceived in a difficult examination, equal. I may take this opportunity of stating, that, although the plates in the Flor. Peruv. are disgracefully inaccurate, wherever I had doubted the text of Ruiz, I have found subsequent reason to bear testimony to his great accuracy. He would not have named any plant Pancratium which had not some appearance of a cup. Chlidanthus increases so rapidly by offsets and splitting of the main bulb that it is difficult to keep bulbs of a size to flower. It grows very vigorously, and flowers in June or July, in a border of which the soil is much warmed by contact with the wall of a stove. In the open garden it flourishes, if taken up and kept dry in winter, but the bulbs seem liable to canker in peat. It has very much the constitution of the tender Narcisseæ, and likes a fertile loam; but, except where the ground is heated by a flue, the bulbs, if not killed by frost, are injured by moisture. They should be taken up at the approach of winter without destroying the fibres, and placed in a pot of sufficient size to contain them, dry sandy soil being poured in to cover them; they may then be set in any dry warm situation till April, when, however dry they may be, they will begin to sprout. All offsets should then be taken off, and they may be set either in pots or in a sunny border. No native specimens of this plant occur in any herbarium with which I am acquainted. Mr. Brookes's bulbs were said to have come from Chili, but I have some reason for doubting the fact. Bulbs of Chlid. fragrans were sent to my brother from Buenos Ayres about the same time, I believe at the same time precisely; but it may have been an inhabitant of gardens there, like Ismene Caláthina, which accompanied it. Mr. Ker and Dr. Lindley were quite mistaken in identifying this sessile plant with Pancratium luteum of Ruiz, the Clinanthus luteus of my appendix, a pedunculated plant, concerning which see the next genus.

45. CLINÁNTHUS.—Tube long, funnel-shaped; limb short, continuous; filaments acuminately winged (connected by the wings?) decurrent; anthers short, broad at the base, erect, attached at the base. [Scape pedunculated; spathe 2-valved; germen round; leaves linear lorate, sheathing at the base.] Native of Peru.

1. Lúteus.—Pl. 27. f. 1. Herb. App. 40. Specimina Pancr. luteum. Ruiz. Herb. Lamb. Leaves 6 or 7 inches long (at the time of flowering, perhaps longer when full grown); ⅜-⅝ wide, subacute; scape 2-flowered; peduncles ⅝-1¼ long; perianth yellow, near two inches long, tube 1¼, limb near ¾, segments rather obtuse. The specimens seem to be all two-flowered, two of them being perfect, the others broken.

It seems strange that, after I had described this plant and Chlid. fragrans, this with long peduncles and small flowers should have been mistaken for a half-blown specimen of Chlid. fragrans, which has the flowers nearly twice as

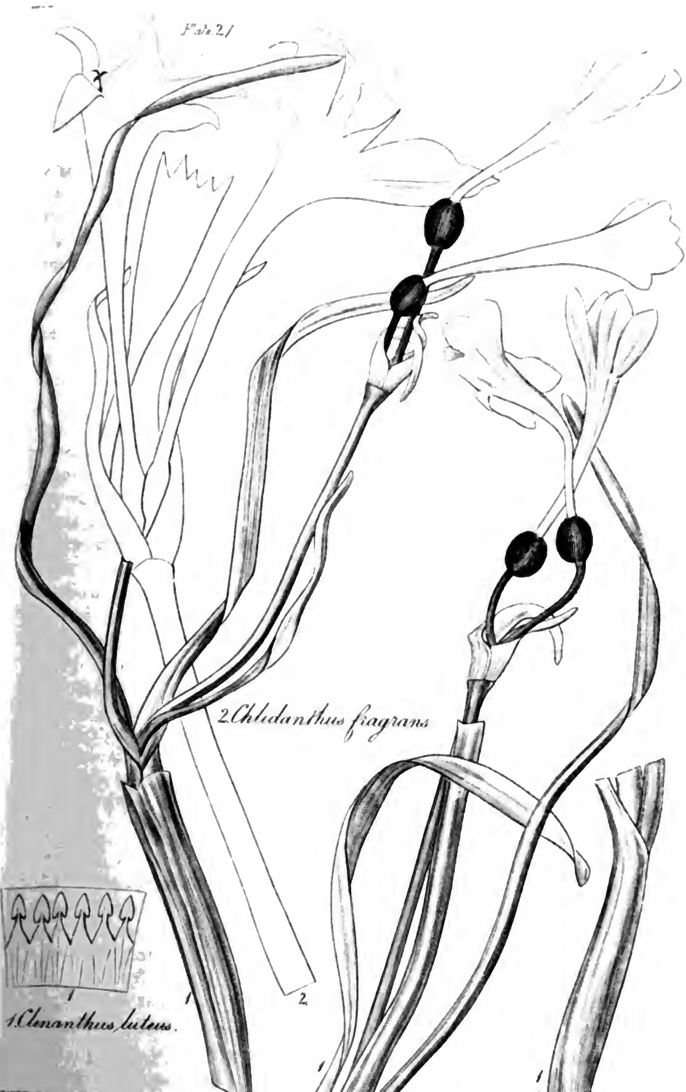


Plate 21
1
2
2.Chlidanthus fragrans
1
1
1
1.Clinanthus luteus.
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long, with a limb four times as large, and the germen subsessile; indeed it is described in the Collectanea as actually sessile. With a little more consideration, before I was charged with having made two genera of one species, it might have been perceived that it was as impossible for a flower, which has a long peduncle before it attains its full size, to have none, and become sessile when full blown, as for a man to become shorter in the maturity of life; but the most accurate of men are liable to such occasional oversights. The comparison of two plants in the same state, whether dry or fresh, is more satisfactory than that of a fresh plant with a dry specimen, in which the parts may collapse unequally: I have therefore given an exact outline of a dry specimen of Chlid. fragrans in the same plate with the outlines of Clinanthus luteus, where their difference is very manifest. My description of C. luteus in the App. was made from the upper of the two specimens of that plant therein represented, in which the flower has a most decided slope from the germen, instead of being erect as in Chlidanthus. The second specimen, laid in since that time, makes it a little doubtful what the posture of the living flower may be, but the dissection gives an interior different from Chlidanthus. The round pedunculated germen gives reason to expect also a difference in the fruit. I think the flowers cannot be naturally erect, but that some of them, in the newer specimens, have been forced into an erect posture in pressing them under paper. If it should hereafter appear, that in consequence of any variability of an imperfect cup, they can be generically united, I should wish the name Chlidanthus to be preferred. I believe, however, that the dentate cup of Clinanthus will be found to be perfect, and the genus separate. It is evident that they are two very distinct species.

64. Urceolína.—Bulb roundish; leaves petiolated, broad oval, æstival; scape æstival, germen ovate, three-furrowed; peduncles curved, flowers pendulous; tube straight, slender, cylindrical, enlarged at the mouth; limb ventricose; (filaments a little diverging?) anthers incumbent, style straight, stigma obtuse. Seeds numerous, small (black?)

1. Péndula. — Crinum urceolatum. Flor. Per. Urceolaria. Herb. App. Urceolina. Reichenbach. Colla-

nia. R. et Schultes. Leaves petiolated, 3 palms long and half a palm wide; scape 1 foot, flowers 5, two inches long, lower half of the limb yellow, upper green with white edges; filaments and style longer than the limb. Grows in the woods of the Andes at Pozuzo, and in the district of Pampamarca in Peru; and flowers from June to November. The size of the flower is probably grossly exaggerated in the plate in the Flor. Peruv. If it is not, the plant I have named Fulva is very different from it.

2. Fúlva.—Pl. 26. fig. 5. Specim. Matthews, 868. C. urceolatum. Herb. Hooker. Petiole 4 inches, leaf 9 inches by 4; scape 7½, spathe 2 inches, with five valves; peduncles of various length, flowers eight, germen ovate, tube slender, above half an inch long, limb near an inch (tawny, with pale margins, and tipped with green ?) filaments and style longer than the limb. Found at Parcahuanca in Peru in December.

This may perhaps be only a variety of the former, but its flowers are smaller and more numerous, and its colour seemingly different: Ruiz states five to be the number of flowers in the first species. This is distinguishable from Leperiza (Ruiz's Pancratium latifolium) by no outward feature besides the supposed absence of a cup, but a longer and slenderer tube and broader leaf; and I consider the two genera to be so closely allied, that I think some attempt to form a membranous cup must be found in this genus when better known. Under that persuasion I place it in this section. If there is no exhibition of the membrane, it must be removed to the second section, after Lapiedra. The plants which I possess, probably the second species, produce from two to three leaves, which suffer very much if exposed to a hot sun, from which they require to be screened. They must be kept quite dry in winter in the greenhouse, and in very hot weather I found it advisable to place them out of doors behind a north wall. They are accustomed to the shade of woods. The bulbs increase by offsets, of which the leaf pushes up at some distance from the parent. The leaf is much like that of Eucrosia and Griffinia, but with a longer and slenderer footstalk; the habit precisely that of Eucrosia. It seems to dislike strong heat and sunshine so much, that it will perhaps succeed best in the open ground, taking up the bulbs when the leaves decay. It seems to thrive better in a fertile loam than in light soil. I expect, from the increased size of my principal bulb, to see it flower next spring.

47. Leperíza.—Bulb roundish; (coats imbricating?) leaves petiolated, wide oval, æstival; scape æstival; peduncles curved; germen ovate, three-furrowed, pendulous; tube short; filaments decurrent in the cup; anthers incumbent; style straight; stigma obtuse; capsule ovate, three-furrowed; seeds many, small, oblong, roundish (black?)

1. Latifólia.—Pancratium latifolium. Flor. Per. 3. 54. 284. Leaves about four, narrower than in Urceolina; scape 8-9 inches; spathe 5-6 valved, or with spathe-like bractes; flowers about five, 1½ inch long, reddish yellow tipped with green; cup toothed between the filaments; filaments a little, style much, exceeding the limb. Grows in the shady and damp woods of the Peruvian Andes near Vitoc, on the hills and lands of Tarma.

The extraordinary bulb, represented in the plate of the Flor. Per. with opposite coats like the scales of a lilium, and the sinuosity of the filaments, are not warranted by Ruiz's description, and are probably false, like many other things in those engravings. If that be the case, it will be separated from Urceolina by the cup and tube only, and, if Urceolina should prove to agree with it in those respects, Leperiza will merge in that genus. Its habit seems, by Ruiz's account, to be precisely similar.

48. Carpódetes.—Bulb oblong; leaves vaginating, attenuated upwards; spathe one-leaved, peduncles erect; germen oblong, constricted in the middle; tube cylindrical, slender, curved (enlarged upwards?) limb regular (cup short?) filaments straight, alternately equal; style straight; stigma obtuse; capsule obovate, three-furrowed, constricted in the middle; seeds large. In steep broken ground near Obragillo, in the province of Canta in Peru; called Chihuanhuaita by the natives.

1. Recurváta.—Pancratium recurvatum. Flor. Per. 3. 54. 285. Bulb purplish with black spots and a long

neck; leaves half an inch wide, about 10 long, rather obtuse; scape rising in the centre shorter; spathe very large, purple, slit on one side, near 4 inches long; peduncles 3, unequal, 1¾-4½ long; colour of the flower between purple and yellow; style scarcely longer than the filaments.

This plant is evidently of a genus quite distinct from any other that is known, and differs widely in bulb and foliage, as well as in flower, fruit, and habit, from Stenomesson and Leperiza, with which Mr. Ker wished to unite it. It is much more nearly allied to Coburghia.

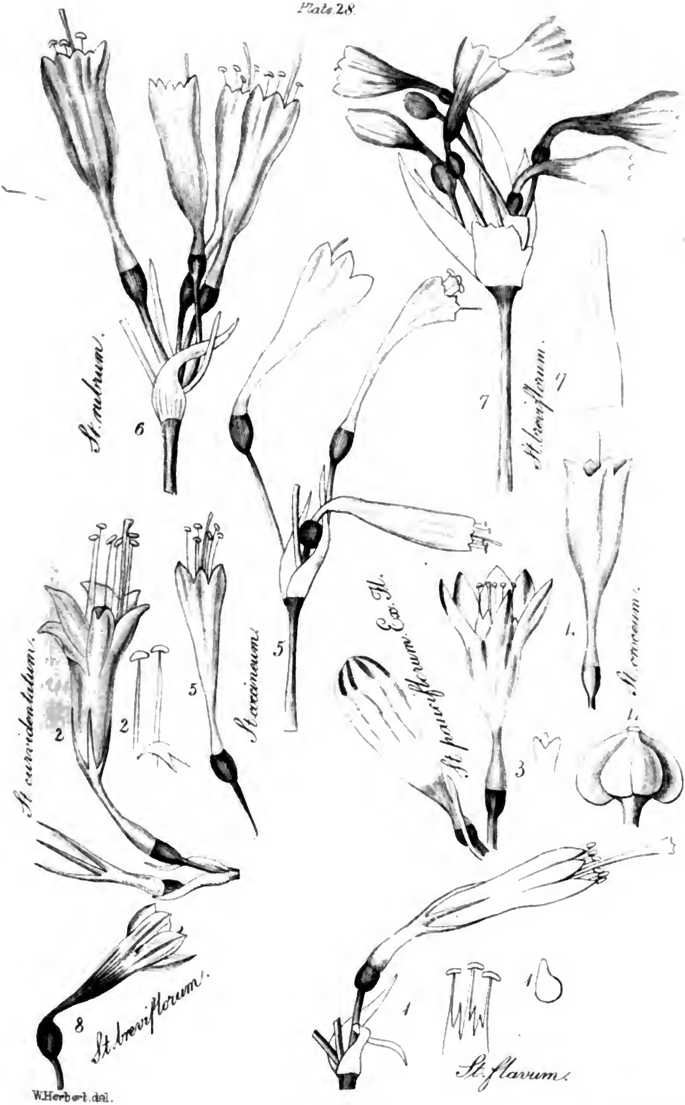
49. Cobúrghia.—Bulb ovate; germen ovate, 3-furrowed; tube bent, cylindrical; subventricosely enlarged; limb shorter than the tube, equal, half open, cernuous; filaments nearly equal, a little conniving, connected by a tubular cup; anthers erect; style a little recurved; stigma obtuse, triangular; capsule erect; oblong, triangular, 3-lobed, 3-celled, 3-valved; seeds black.

1. Incarnáta.—Sweet Br. fl. g. s. 2. 17. Panc. incarn. Kunth. nov. gen. 1. 223. Leaves thick, glaucous, obtuse; peduncles short; flowers under 5 inches, crimson, with a green spot on each segment; cup campanulate, 12-toothed; style equal to the filaments, shorter than the limb. From Quito, on the banks of the river Machangara. The bulb is larger, the leaves larger, and less obtuse than in Trichroma.

2. Trichróma.—Panc. trichromum. Nov. veg. d. De la Llave et Lexarza. fasc. 1. Leaves thick, glaucous, obtuse; scape a little longer, 5-flowered; flowers near 3 inches; tube 2 inches, enlarged, furrowed, light red; segments ovate, suberect, with an oblong ovate spot, white within, green without, lined with green; sepals hooked, petals acute; cup very short, with green-tipped teeth; filaments erect, much longer; anthers linear, erect, after inversion versatile. Cultivated in pots with great care at Mexico, where it flowers at various seasons. Native habitation not recorded.

3. Variegáta.—Panc. varieg. Flor. Peruv. 3. 55. Leaves thick, glaucous; spathe with 2 outer valves, and

Plate 28.



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5 spathe-like bractes; peduncles short, curved; flowers a span long, cernuous; tube yellow and rose-coloured; the limb yellow, margined with rose colour, with a spot on each segment, green without and white within; sepals wider, longer; cup tubular, much shorter than the limb, with six little forked reflex green teeth; filaments shorter than the style, which equals the limb. In gardens at Lima. Precise habitation not known.

These three species are not very easily distinguished from each other in bulb and foliage; they increase rapidly by offsets, and are very unwilling to flower with us. The first is larger, with broader leaves.

4. Fúlva.—Bot. Reg. 18. 1497. Bot. Mag. 60. 3221. Leaves sub-glaucous, thinner than the three former; peduncles short; tube 3¼ inches, fulvous; limb 1¼, fulvous, tipped with green; cup half an inch; filaments nearly equal to the limb, style longer. The precise habitation of this beautiful plant is not known, the bulbs having been purchased at Liverpool by J. Wilmore, Esq. of Oldfield, near Birmingham; by whose gardener it was obligingly communicated to mine, who mislaid his direction. It was figured in the Register before I had ascertained to whom I was indebted for it, and indeed I never learned till I read it in the B. Magazine.

I have ascertained that all those bulbs succeed well in a strong rich alluvial soil, and probably they will like old rotten manure; they thrive well in the open ground in summer, but must be taken up and kept dry, or nearly so, in winter. The bulbs are not delicate, but will not endure our winter, except near the front wall of a stove, or with some protection to keep them dry. I consider the application of heat, after the full growth of the leaves, to be the most likely way to promote their flowering, but the first growth of the leaves should be made in a cool and airy situation, or they will be weak.

5? Díscolor.—Feuillet, Obs. 2. p. 29. Lilio-narcissus polyanthus. cum icone. Bulb 2 inches long, rather less wide, chesnut coloured; scape 2 feet high, a little flattened and two-edged; leaves 6 or 7, surrounding the scape, 9 inches long and ½ an inch wide at the time of flowering, fine green, deeply channelled, smooth, obtuse; umbel 4-5-flowered; perianth red on the outside, variegated with red and yellow within; tube about one inch long, one line wide at the bottom, enlarged upwards; limb with rounded lobes. Found on mountains of Chili, and in 17° 39′ south lat. which must be in La Paz of Peru. It is possible that this plant may be a Clinanthus, but I have very little doubt in referring it to Coburghia, and I apprehend that it must be allied to Fulva.

50. STENOMÉSSON.—Bulb roundish, neck very narrow; leaves at first compressed at the margin; umbel 2-6 or more flowered, pedunculated; tube constricted in the middle, wider upwards, a little curved; limb short; filaments straight, connected by a membrane; anthers short, incumbent; style straight, before maturity sloping; stigma dilated; capsule broad-ovate, 3-furrowed, 3-lobed, 3-celled; seeds black, obliquely oblong.

1. Flávum.—Pl. 28. f. 1. Bot. Mag. 52. 2641. Pancrat. flavum. Flor. Per. 3. 54. 284. Chrysiphiala flava. Bot. Reg. 10. 778. Perianth golden; teeth of the cup straight, irregular; filaments a little, style much, longer than the limb. On sandy hills in Peru by Lurin and Pachacama.

2. Curvidentátum.—Pl. 28. f. 2. Bot. Mag. 52. 2640. Sphærótele Peruviana. Prezl Rel. Hank. p. 119. t. 16. Specim. Matthews, 399. ex collibus Amancaes prope Limam Herb. Hooker. Herb. Lindl. Perianth golden, slender; teeth of the cup long, bifid, recurved; style and filaments equal, longer than the limb; flowers 2-7. The Sphærotele of Prezl is unquestionably this plant.

3. Pauciflórum.—Pl. 28. f. 3. Chrysiphiala pauciflora. Hooker. Ex. Flor. t. 132. Perianth golden, thicker, shorter than in Curvidentatum; tube and tips green, teeth of the crown short, bifid, recurved.

4. Aurantíacum.—Humb. Kunth, 1. 280. Leaves lance-linear, 5 flowered or under; perianth orange, 14-15 lines long; peduncles 1-1½ inch; intervals of the cup repand; filaments shorter, style longer, than

the limb. Found near Chillo in the province of Quito.

5. Breviflórum.—Pl. 28. f. 7. 7*b*. Specim. Herb. Lindl. Herb. Hooker. Matthews, 657. Spec. nov. ex Tarmâ Peruviæ mense Jul. floribus 7-8 roseis, foliis nondum natis. Scapo 10 unc. spathâ 2-unc. pedunc. inæqual. ¾-1½ unc. perianthio 1¼ unc. roseo, stylo vix limbum superante. Seven or eight rose-coloured flowers 1¼ inch long.

6. Coccíneum.—Pl. 28. f. 5. Pancr. coccin. Flor. Per. 3. 54. 2853. Ex Tarmâ Peruviæ; floribus coccineis, perianthio biunc. graciliore; spathâ graciliore; filamentis limbum superante, stylo longiore. Coccineum has a slenderer spathe, fewer flowers, scarlet, slenderer and longer than Breviflorum. In the dry specimens it looks almost like a Phycella.

I am not without suspicion that Ruiz has made a great error concerning his P. coccineum, and that the figure in the Flor. Per. is a representation of his specimen labelled P. rubrum, and his specimen of coccineum a Phycella, allied to graciliflora. It does not seem likely that the artist through inaccuracy should have so varied from the truth, as to give precisely the usual shape of the flower of Stenomesson, of which he had no knowledge, when the specimen departs from it: wherefore I think he must have copied rubrum, of which the plate is a fair representation. If my suspicion should prove correct, rubrum will be to be erased. The confusion will probably have in some degree extended to the text.

7. Rúbrum.—Pl. 28. f. 6. Specim. Ruiz. Herb. Lambert. Floribus quinque, pedunculis ferè æqual. unc. perianthio rectiore, rubro, latiore, 1⅝ unc. filamentis limbum superantibus, stylo longiore. This plant has in the specimen (perhaps not in fact) the flowers straighter and more erect than usual, the flowers large and red.

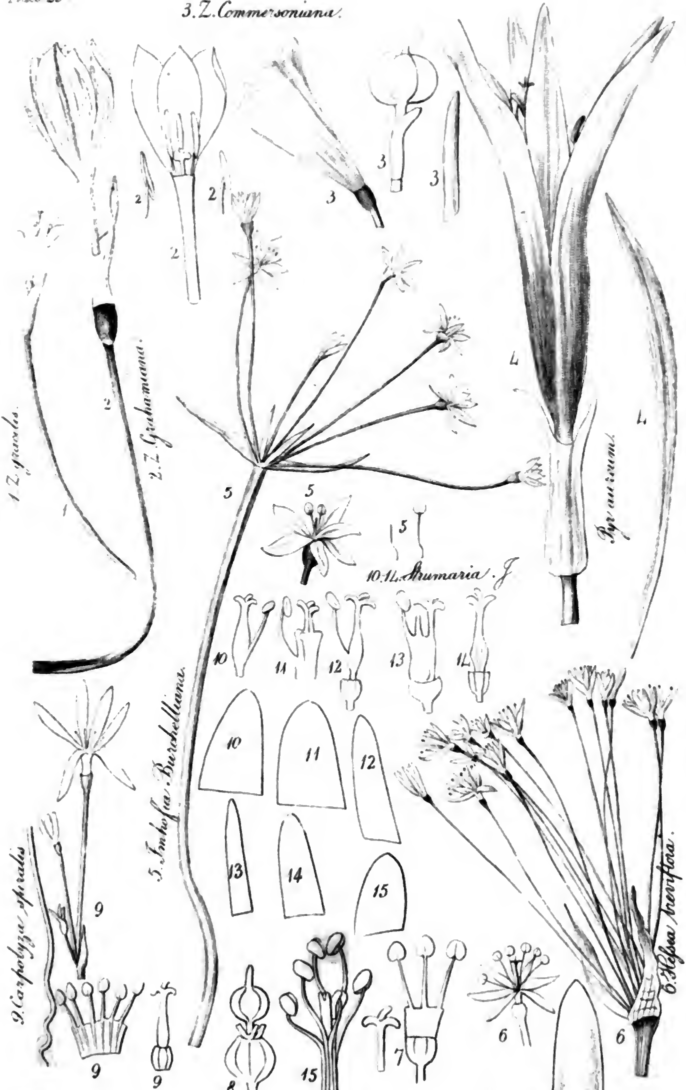
8 ? Cróceum.—Pl. 28. f. 4. Specim. Dombey Herb. Soc. Linn. Panc. croceum. Redouté lil. 187. Si fides iconi adhibenda est, a flavo foliis præcipue et stylo breviore distinguenda; pessimè depicta, et flavi forsan var. certè non coccineum neque aurantiacum. Dombey's specimen is certainly the same as Redouté's plant, and it looks different from flavum.

The leaf is described as channelled, and having the margins recurved like flavum, but the engraving gives leaves quite foreign to the genus, and perhaps taken by mistake from some other plant, as the plant had no leaves at the time of flowering. Mr. Ker was misled to refer this plant to Coccineum, which differs in form as well as colour, by the faulty engraving in the Flor. Per. The difference will be seen at once on comparing the outline of Dombey's specimen with that of Ruiz's coccineum. See Pl. 28. f. 4 and 5.

This genus was named by me from the singular slenderness of the middle part of the tube, which is wider below and bell-shaped above. Mr. Ker afterwards altered the name to Chrysiphiala, likening it to an hour-glass, from the same feature of constriction in the middle of the tube, and he proposed to add it to the genus Leperiza and Carpodetes. Whether those two genera ought or ought not to merge in it, the name Stenomesson having the priority must be retained, nor could there be any reason for changing it for one founded on the same feature. The proposed addition to the genus is equally objectionable, for the affinity of Carpodetes, as far as we know, is to Coburghia, and Leperiza seems to approach nearer to Urceolina, but neither of them can possibly belong to this genus. I have given the outline of the capsule of Stenomesson croceum from Dombey's specimen, which agrees with Ruiz's representations. It is very broad at bottom and tapering to a point: that of Carpodetes very broad at top and constricted in the middle. Stenomesson likes a sandy soil, shade, and plenty of moisture in summer, complete rest in winter. It flowers before the leaves rise. The reader must be cautioned, that Mr. Ker's descriptions of plants from the Flor. Per. in the Journal of Science and Arts, cannot be perfectly relied upon, not from any error of his, but because they have been made indiscriminately, not from the text of Ruiz only, which may generally be trusted, but from the plates also, in which the grossest inaccuracies have since been detected.

51. Eucrósia.—Bulb round; leaves wide, petiolated; scape tapering; umbel 4- (more?) flowered, pedunculated; germen erect; ovules oblong, heaped in two rows alternating, attached at the inner angle of the cell;

Plate 29



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tube oblique, abbreviated underneath; limb compressed, recurved; segments alternately alike; cup declined, abbreviated and rostrate above, shovel-formed and prolonged below; filaments long, recurved; anthers attached at one-third from the top, pendulous; style at first sloped down, afterwards recurved; stigma obtuse, dilated, downy. Fruit not seen, but capsule evidently ovate, 3-furrowed.

1. Bícolor.—Bot. Reg. 207. Bot. Mag. 51. 2490. I have given an ample and careful account of this plant in the Bot. Mag. to which the reader is referred. The figure in the Reg. is far from correct; and on comparison of the figure in the Mag. with the drawing from which it was made, it appears that the colourer has not made it near bright enough; the colour is nearer that of vermilion, the stripe in the buds dark green unmixed with yellow, the cup pale vermilion. The yellow colour of the flowers in the Magazine is quite incorrect. I know not on what authority Mr. Sweet stated it to be a native of Cape Horn; had it come from so cold a situation, Mr. Lee would scarcely have lost all his bulbs by leaving them in a cold frame in winter. I only know that it came from South America. I have usually kept it in the stove, or a very dry part of the greenhouse without water in the winter; in summer it is thirsty and requires shade, having much the same habit as Urceolina. It thrives in a pretty strong alluvial soil.

52. **Eliséna.**—Bulb roundish; leaves linear, lorate, erect; scape few-flowered; germen oblong; tube short, cylindrical; limb reflex; segments linear, (4 recurved, 2 declined?) cup declined, cylindrical, with a repand recurved margin; filaments and style filiform, declined, recurved; alternate filaments equal; anthers incumbent. Fruit unknown. Scape presumed to be solid.

1. Ríngens.—Pancratium ringens. Flor. Peruv. 283. Liriope ringens. Herb. App. scape 5-flowered; peduncles very short; tube short, green; tube greenish, $\frac{3}{4}$ of an inch long; filaments about equal to the limb, style longer. In gardens in Peru. Precise habitation not known.

This is a singular plant, if any reliance can be placed on the engraving. The declined cup marks an affinity to Eucrosia, the only other genus in which it is found.

53. **Pancrátium.**—Bulb ovate or roundish; perianth with a cylindrical tube and patent limb; filaments stiff and conniving; anthers short, suberectly incumbent. A. flowers subsessile, with persistent leaves. B. pedunculated, with deciduous leaves. C. sessile or subsessile, with deciduous leaves. N.B. The colour of the flowers in this genus is invariably white with a tinge of green on the outside, except in Illyricum which has no green.

A. *Species subsessiles, foliis persistentibus.*

1. Marítimum.—Bot. Reg. 5. 161. Red. lil. 8. Flor. Græc. 4. t. 309. Semina mihi, t. 34. f. 21, 22. anthera, 42. f. 7. Limb with segments attached to the cup, at about one-third from their base; cup campanulate with two teeth between every pair of stamens; filaments free about one-third of their length, decurrent in the cup; flowers fugacious.
2. Caroliniánum.—Bot. Reg. 11. 927. foliis perperam viridibus. P. maritimum, Pursh. Anthera, Pl. 42. f. 8.

B. *Pedunculatæ, foliis deciduis.*

3. Canariénse.—Bot. Reg. 2. 174.
4. Illýricum.—Bot. Mag. 19. 718. Limbo rigidulo, coronâ brevi patenter infundibuliformi, interdum fissâ, antheris erecto-incumbentibus infra medium affixis, stylo superne attenuato, seminibus rotundato-oblongis, raphe albicante. Genus Hálmyra?

C. *Sessiles aut subsessiles, foliis deciduis. Genus Tiaranthus?*

5. Malabáthricum.—Rheede, Hort. Mal. 11. 79. t. 40. Catulli-pola, floribus 7-8, (seminibus carnosis?)
6. Verecúndum.—Bot. Reg. 5. 413. Hort. Kew. Biflorum et Triflorum, Roxburgh.
7. Zeylánicum.—Bot. Mag. 52. 2538. Bot. Reg. 6. 479.
8. Cambayénse.—Pl. 42. f. 1. Specim. ex Cambay. Hove. Herb. Banks. O—1.
9. Longiflórum.—Pl. 42. f. 2. Specim. Roxburgh. Herb. Banks.
10. Máximum.—Forskæl. Flor. Ægypt. Arab. 72.

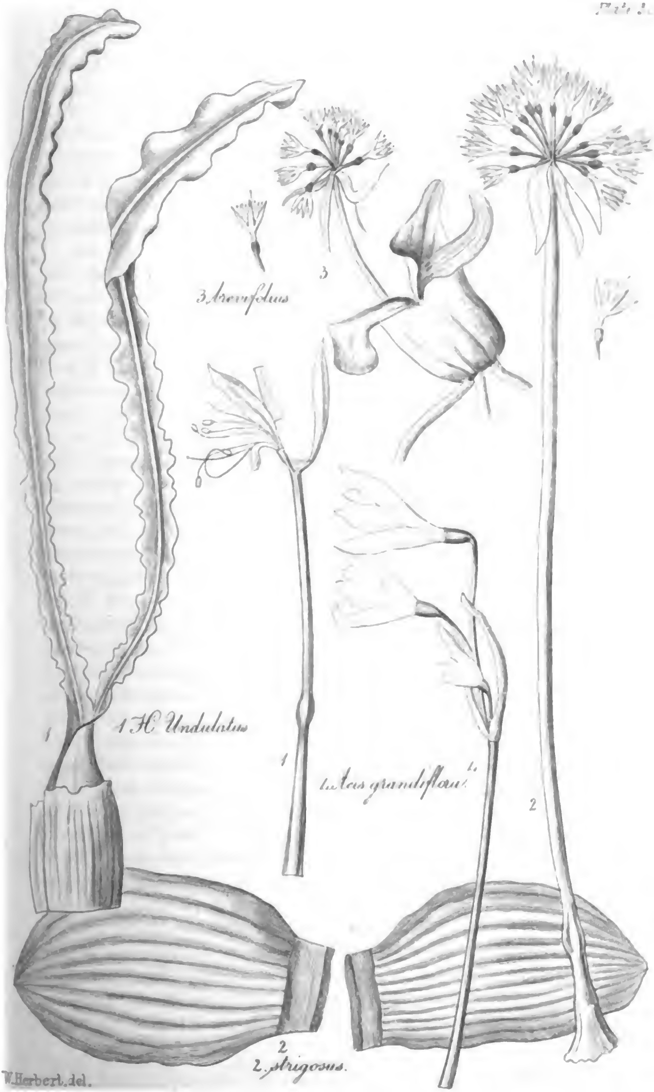
The name Pancratium indicates that the bulb was supposed by the Greeks to be of universal efficacy in medicinal application. The Pancratium of Clusius appears to be Scilla maritima, and it is very probable that Pliny intended to designate the same plant; this however is certain that the name belongs to a maritime European bulb; and amongst the plants to which it has been attached by later botanists, P. maritimum, the seaside European species, must be considered as the type of the genus. It is evident that the American plants which have been confounded with it, cannot be permitted to usurp the name. Whether or not the three sections, into which I have divided the genus, are several genera, I cannot decide without further knowledge of the plants, and some better assurance than the assertion of Rheede, who is not always correct, concerning the fruit of the Asiatic species. I have found the scape of maritimum and Illyricum to be solid, that of Illyricum being a little hollow near the summit. The scape of the other species has not been examined, but I have seen no plant of this order with a staminiferous cup and hollow scape. The scape of Illyricum in this respect approximates to the Narcisseæ, in which the fistular cavity is more or less filled up in different species.

1. Maritimum has acute glaucous leaves of a hard texture, and sheathing at their base. The representation of the plant in the Bot. Reg. is very bad, and the cup quite out of drawing. Even Clusius's rough figure under the name of Hemerocallis Valentina is better. The plant is a native of the sea sand of the Mediterranean. I have two bulbs that were dug up by my lamented brother the Earl of Carnarvon on the coast of Ischia, and he told me that the sand where it grew was so hot when the sun shone powerfully, that he could not bear to keep his hand upon it. This circumstance marks the difficulty of cultivating it, as it enjoys an air at some times cool and temperate, a burning sand to the bulb at others, and perhaps the fibres may reach below the high water mark. I believe the best way of treating it is that recommended long ago by Hill; to set it out doors late in the spring, and at the latter part of the summer to bring it into the stove to flower, removing it afterwards into the greenhouse. When placed on a hot flue it requires frequent watering, and the leaves are soon scorched if it is neglected.

2. Carolinianum.—I am rather inclined to consider this plant a variety of Maritimum, that is to say the distinguishing

features, as far as I know, are not very considerable, and their permanency may be doubted; but it is not absolutely identical with the Mediterranean plant as Pursh supposed. I received from Dr. Carey bulbs which had been long cultivated at Calcutta under the name of Maritimum, and flowered there freely, concerning which he wished my opinion, as he found the European Maritimum, which he had received from me, different in foliage, and very impatient of the East Indian climate, where it did not flower and was with difficulty preserved. His bulbs were undoubtedly the Maritimum of Pursh. With me they have flowered once, and increase by offsets rapidly. The principal difference is that the leaves are much less acute, and wider (I have measured a vigorous leaf seven-eighths of an inch wide), and they do not vaginate near so high as the European plant, indeed but little above ground. Their texture is also smoother and softer to the touch, and the glaucous hue not quite so intense, and more easily washed off by heavy rains. It is however quite a mistake to suppose that the leaves are not glaucous. The figure in the Bot. Reg. 927. has the leaf very incorrect in that respect. I know that the plant from which it was made, belonging to my lamented brother, Mr. George Herbert, had glaucous foliage, and if the leaf appeared to the artist of the colour represented in the engraving, it must have been quite discoloured by being packed wet. The figure of the Carolinian Pancratium, in Catesby's work, is unquestionably a very bad representation of Hymenocallis rotata, with bright green leaves, and it is stated by him to grow in a bog, as H. rotata does, near Pallachacula an Indian town in Georgia, which is quite contrary to the habit of the genus Pancratium, of which the fibres rot if too much watered. I have not had an opportunity of comparing the living flowers of Maritimum and Carolinianum, but I can see little to distinguish them; and in dry specimens I observe some variation amongst individuals. I have given a representation of the seed of P. maritimum, which was ripened several years ago and sent to me by the kindness of the Rev. Mr. Hutton. It exactly accords with the figure of the seed given by Clusius, which is very correct. The seeds imbricate, lying in two horizontal rows; they have a thin brittle black shell, a broad back, a wedge-like edge, and a margin a little inclined to be foliaceous.—These two species do not lose their leaves in the winter, which is an important distinction. The two bulbs from Ischia have

Tab. 3.



W. Herbert. del.

been several years at Spofforth without producing an offset, but the broad-leaved or Carolina plants increase rapidly. I cannot perceive the difference of anther mentioned by Mr. Ker, and indeed such a difference, if strongly marked, would be scarcely consistent with generic identity. The anthers of both are what I call suberect, that is neither incumbent nor quite erect. In dried specimens the posture becomes much disarranged. The attachment is nearer the middle than in Hymenocallis.

3. Canariénse.—One bulb of this species was brought to Europe by Dr. Schmidt, and found its way into the collection of Mr. Griffin, where it flowered and ripened seeds, which, as Mr. Griffin told me, had some tendency to a foliaceous margin. I know not into whose hands the bulb passed after Mr. Griffin's death, nor have I heard of any other having been imported. It lost its leaves in the winter like Illyricum, with which it agrees in being pedunculated.

4. Illýricum.—This bulb, which is often sold erroneously as imported from Holland under the name of Maritimum, is perfectly hardy, flowering and ripening seed freely in our gardens: but the seedlings are of slow progress, and do not flower till they are many years old. It likes a rich and even manured soil. Its seeds are round-oblong, covered with a pretty hard black shell, and have an elevated white raphe, while those of Maritimum are more foliaceous, wedge-shaped with a round back, and the hilum a white speck without any elevated raphe. I communicated the seeds of both to a distinguished botanist, without mentioning to what plants they belonged, and asked whether he should suppose they were of one genus or not, and the answer was he should rather suppose not. If the seed of Canariense should be found to agree with that of Illyricum, considering that both are pedunculated and deciduous, I should not doubt the correctness of Mr. Salisbury's separation of Illyricum, under the name Halmyra Illyrica. The flower of Illyricum is distinguishable from all the rest in having the inside of the cup and the base of the limb yellow, the tube yellowish, the cup wide funnel-shaped, almost patent, and so short that it is little more than a connection of winged bases to the filaments, and I have found it occasionally split to the base between the filaments in one or two places, which makes it approximate a little to Vagaria parviflora, concerning which our knowledge is imperfect. On the whole, in our present ignorance of the fruit

of the Asiatic section, and insufficient acquaintance with the fruit and stamens of Canariense, I wish to postpone deciding whether the seminal difference between Illyricum and Maritimum is absolute or not, especially as I have no opportunity of re-examining the style and stamens of Maritimum. I am inclined however to think that it is, and that there are sufficient symptomatic features to indicate the diversity.

5. Malabathricum.—This plant is only known from Rheede's Hort. Malab. where it is called by the native name Catulli-pola. Mr. Ker quotes it as synonymous to Verecundum, which he calls 3-4-flowered. I have never known or heard that the flowers of that species exceed three, and it was only known to Dr. Roxburgh as bearing either two or three, to which he particularly limited it by his name triflorum; but Rheede described his plant as having from seven to eight. Rheede says that its fructification is similar to that of a Crinum, and he gives a very correct representation of a Crinum seed; and adds that the seed of Catulli-pola is whitish, with a whitish watery flesh, and a watery taste. If this account be true, and without some grounds I cannot reject such a positive assertion, though he is often incorrect, the Asiatic species must be of a different genus, which I should call, as proposed many years ago, Tiaranthus, following the idea of Mr. Salisbury when he changed the name Zeylanicum without cause to Tiaræflorum. I have vainly attempted to obtain seed of any Asiatic species. Dr. Wallich should try to procure this Catulli-pola from the Malabar coast. It is stated by Rheede to grow in sandy places, but he does not say on the sea-side. Whether it should be called a polyanthous variety of Verecundum, or a distinct species, I cannot judge without seeing the plant, and knowing how it agrees in other respects. Very little reliance can be placed on the figures of Rheede. He did not always consider the difference between a peduncle and a tube.

6. Verecúndum is abundant in the meadows near the river in the vicinity of Calcutta, but Dr. Carey could never send me a seed of it, and answered that he had never seen one. Whether the plant only perfects its seeds in a cooler situation, from whence they may be brought down by the floods, or my worthy friend did not inquire beyond the limits of his own garden, I know not, but, though I wrote several times on the subject, I could obtain no account of the seed of any oriental species. This plant is very difficult to culti-

vate here, though Dr. Carey said it was free and abundant at Calcutta. In the hothouse its leaves flag whenever the sun shines upon them, and the bulbs are apt to rot during the season of rest when kept dry in the stove. I have lost the species, and I imagine that it required an alluvial and stronger soil than I gave it, and that the bulbs should have been removed into a cooler place in the winter. They come over very sound, when sent from Calcutta. The scape is 2-3-flowered; the peduncles not half an inch long; tube 2 inches long according to Solander Hort. Kew., 3½ in my plants from Calcutta figured in the Bot. Reg., limb in both shorter than the tube; cup with six interstamineous teeth; leaves bright green, acute, ¾ of an inch wide.

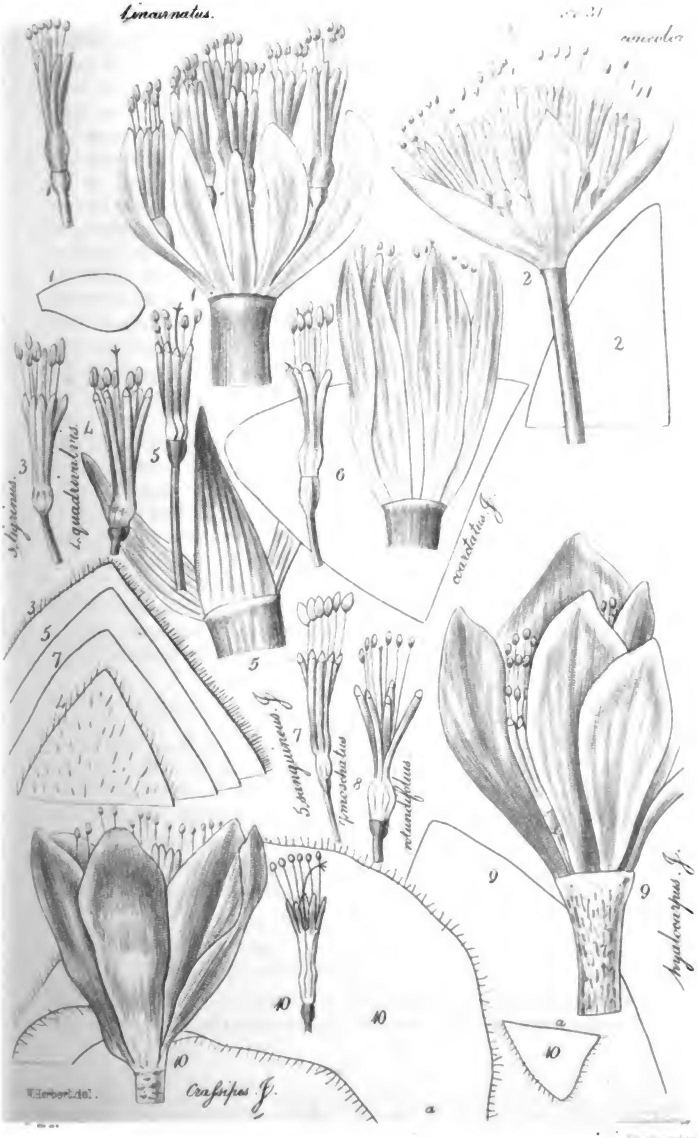
7. Zeylanicum.—Scape one-flowered; germen sessile; tube about 1⅛ inch; limb longer than the tube, the lower part adhering to the cup; filaments exceeding the teeth of the cup by about the length of the cup and teeth; leaves bright green, narrow-lanceolate, acute, narrower than those of Verecundum. Unless the flower varies more than I imagine it does, the cup and stamens are too long in the figure in the Bot. Reg. It is less difficult to cultivate than Verecundum, but very liable to perish here, and scarce in the gardens of Calcutta.

8. Cambayénse.—Specimina Herb. Banks. O—1. ex montibus Cambay Ind. Orient. prope Guzzerat, in planitie arenosâ. A. P. Hove. Bulbus subrotundus collo cylindrico, folia linearia obtusa ⅛ unciæ latæ, scapus ultra 4-uncialis, flos unicus sessilis, tubus gracilis 2¾ unc. limbus 2¼ unc. stylus ⅜ unc. limbo brevior. There are many specimens of this plant in the Banks. herb. gathered by Hove on a sandy plain on the Cambay hills in the East Indies, near Guzzerat. The specimens vary very little, and they are strongly distinguished from any species that has been described by their narrow linear obtuse leaves. The tube is much slenderer than that of Longiflorum. The entry in the Banks. herb. in Dryander's writing, is as follows:—"Panc. longiflorum fl. sessili solitario nectario duas tertias partes limbi excedente, laciniis limbi patentibus, limbo tubo longissimo breviore. *Linn. fil.*—P. maximum Forsk.? —I believe this to be the same as P. Zeylanicum. If the different specimens from Kœnig and Hove, together with Hove's drawing, are compared with the figure in Commelin, it will be found to vary very much as to the length

of the tube, and the nectary is 12-dentate in Hove's fig. Feb. 90."—Hove's drawing, No. 64, is marked "Gool Sobool, sandy plains, Cambay." Bad as Hove's drawing is, the tube therein is 2⅝ of an inch long, and that of the specimen of Zeylanicum in the Banks. herb. only 1⅝. Hove's drawings are so bad, that he had probably never handled a pencil before; and in this drawing, where the leaves are a great deal too broad and pointed, he has even omitted the style. It is strange that Dryander should have formed an opinion on such a performance, when he had several good specimens before him. The plant has no resemblance to Forskæl's P. maximum, to which he injudiciously refers it, as well as to longiflorum; and the variation of the tube of Zeylanicum from 1⅛ to 1⅝ in length, to which he alludes, is of no importance. In Zeylanicum the limb is usually from two to three times the length of the tube, in all the specimens of Cambayense it is shorter than the tube, but the leaves of the two plants are quite different, the margins in this being parallel, differing in that respect from all the other Asiatic species.

9. Longiflórum.—Specimina Herb. Banks. Leaves acute, lanceolate, half an inch wide, scape very short (about an inch and a quarter), one-flowered, germen sessile, tube 5½ inches long (six according to Roxburgh), limb about three, style nearly equalling the limb. Native of Molucca. It has long been lost at Calcutta; the bulbs have never, I believe, been brought to Europe. It is very different from Cambayense.

10. Máximum.—This plant was described by Forskæl, who saw only one specimen, which had been gathered by his companion, Dr. Niebuhr, near Taæs, in Arabia, a town about fourteen German miles west by north of Mockha. Forskæl did not see its leaves. It was a solitary flower, and he describes severally both the tube and the cup to be a foot long, the limb to be longer than the stamens and patent; but, he adds, not reflex as in Zeylanicum. It is however evident that he must have considered the cup to be a part and prolongation of the tube, and only meant that, taken together, the tube and cup measured a foot in length; for if the cup alone had been a foot long, the stamens, being longer than the cup, and the limb, as he states, exceeding them, the expansion of the flower would have measured at least a yard in width, which is quite incredible. He speaks


1. incarnatus.
concolor
3. tigrinus.
4. quadrivalvis.
coarctatus J.
5. sanguineus J.
7. moschatus
rotundifolius
hyalocarpus J.
a
a
W. Herbert del.
Crassipes J.

of the nectary as enormous, considering the tube to be part thereof; but he does not say that the expansion of the limb was very great. The main part of the length must therefore be occupied by the tube, perhaps nine inches long and the cup three, which would very well entitle the flower to the name Maximum.

A. Pancratium, by name Ægyptiacum, is mentioned in an old catalogue of the plants at Mr. Loddiges' nursery. I learn from him that the plant so designated was brought by a gentleman from Egypt, and appeared to him to be a Pancratium, but perished without having flowered, and no memorandum was preserved concerning it. It cannot therefore be ascertained what it was, and the name must be expunged.

54. Hymenocállis.—Bulb roundish; tube cylindrical, slenderer than the germen; perianth equal, patent, flaccid; crown more or less patent (funnel-shaped or rotate); filaments equal; anthers long, pendulous, attached at one-third of their length from the base, tipping after expansion base-upwards; pollen rough; style long, flaccid, declined; stigma minutely fimbriated, roundish; ovules oblong, 2-8 in a cell, erect; seeds large, oblong, green. *Occidental plants with leaves usually persistent, the scape flattened* 2-*angular, curved downward in seeding, flowers* 1?-21, *white, very fragrant, pollen orange or deep yellow; germen sessile, except H. speciosa.*

A. *Petiolatæ. Leaves petiolate.*

1. Speciósa.—Breviter pedunculata.

Var. 1. Longè petioláta.—P. speciosum. Cup dentate. Bot. Mag. 35. 1453. Red. lil. 412. P. amœnum. Lodd. B. C. 286.

Var. 2. Húmilis, petiolo brevi.—Petiole short, leaves more recumbent.

Var. 3. Augustifólia, vix petiolata.—Leaves narrower, scarcely petiolated.

Var. 4. Frágrans, tubo breviore.—Red. lil. 413. Tube 4 inches long, limb 4½, cup not dentate, but indented between the filaments.

This beautiful species is distinguishable by the short peduncle from all others that are known to us; and, agreeing with Amœna and Guianensis in having petiolated broad leaves, it may be always recognized by their greater thickness and consistence, by a more robust tube, and much more conspicuous flowers. It differs from all the other species in sending up its young leaves not successively, but at periods (perhaps twice a year) simultaneously, the flower-stem just preceding them. P. fragrans, Redouté, is certainly a variety of Speciosa with the foliage of var. 2, but a shorter tube; it is more robust, and has a longer tube than Amœna. This species is the most beautiful, and is cultivated without any particular care in the stove. The petiolated sorts are all natives of very hot countries, and it may be that the habit becomes obsolete in a more temperate climate; for I find in the plants of this species and of Amœna raised from seed produced in my stove, a disposition to depart from the decidedly petiolated habit of the parent, and produce leaves of a more lorate form.

2. Guianénsis.—Folia petiolata, mollia, successiva; tubus limbo longior. Leaves softer than Speciosa, successive; tube 5-8 inches long, longer than the limb.

Var. 1. Prínceps.—Bot. Reg. 4. 265. Tube 6 inches or more; limb 4-5.

280/ Var. 2. Unduláta.—Kunth. 1. 2~~22~~. Tube 5 inches, cup toothed in the intervals.

Var. 3. Tubiflóra.—Salisbury. Hort. Soc. Tr. 1. 341. Tube 8 inches, cup not toothed.

This species occurs in a variety of forms along the coast of Honduras and Guiana, always distinguishable by broad petiolated foliage of a thinner texture than speciosa, much slenderer and less conspicuous flowers, with a tube reaching from 5 to 8 inches in length. The undulation of the limb, from which var. 2. has been named, is of little importance in this genus; I have seen it vary in the same umbel. The dentation of the cup is not less variable. Var. 1. has long petioles, var. 3. much shorter, but endless shades of variation will be found between them. They are plants of very delicate constitution, and if planted in light loam in a dry stove they soon perish. I believe them to be natives of alluvial soil and a half swampy situation. A plant of var. 3. which I have lately placed in water, seems not to be offended by it, but perhaps will not thrive there permanently.

3. Amœ́na.—Folia petiolata, mollia, successiva; tubus limbo brevior. Leaves softer than speciosa, successive, tube shorter than the limb.

Var. 1. Princeps.—P. amœnum. Bot. Mag. 36. 1467. P. fragrans. Andr. Bot. Rep. 556. Lodd. Bot. Cab. 834. Tube 2 inches, limb 3, filaments exceeding the tube 2¼, style 3¼, cup ¾.

Var. 2. Ováta.—P. ovatum. Bot. Reg. 1. 43. Broader leaves.

Var. 3. Loráta, *hortensis*; foliis lanc. lor. suberectis longioribus.

This species is mainly distinguishable from Guianensis by the shortness of its tube, which does not equal the limb, while that of Guianensis is preposterously long. It is tender, but not so difficult to manage as Guianensis. I had from Mr. Griffin the very ovata figured in the Register, but there was very little to distinguish it from Amœna, but rather broader and less erect foliage, and the seedlings raised from the two plants could not be distinguished. Var. 3. was raised at Spofforth from seed of var. 1. and has long, erect, lorate leaves. The circumstance is very singular. The plant had been deprived of its pollen for an experiment, and touched with pollen of another and hardy genus; but some particle of its own pollen must have escaped, as frequently occurs, in the operation, no other Hymenocallis having been in flower at the time. Seeds were produced, very imperfect in their appearance, small, and discoloured. Four seedlings were raised, all exactly alike, and having the appearance of a different species from the parent. I entertained doubts at first whether a bigeneric mule had been obtained, but the plants had not inherited any hardiness from the supposed male parent, and when they flowered the inflorescence differed in nothing from that of Amœna. Does this remarkable occurrence exemplify the manner in which permanent local varieties are produced by peculiarities of temperature, soil, or situation, or by an insufficient quantity of the pollen? I am confident that no other species was in flower at the time; but, supposing me to be mistaken in that point, if the seedlings had been produced by the pollen of H. expansa, to which they approximate in foliage, the form of the flowers must have been affected as well as that of the leaf, which is not the case. These seedlings are much disposed to increase by offsets.

4. Ovalifólia.—Lodd. B. C. 510. This is a very small and delicate species, quite distinct from the variety of Amœnum, to which the name ovatum had been previously given. It has small oval recumbent leaves. It has been lost at Spofforth and Hackney; I know not whether it is preserved at Liverpool, where it was first introduced by Mr. Shepherd. I never saw it in flower, but do not doubt the correctness of the figure cited. The flowers are very slender.

B. *Loratæ; humifusæ vel arcuatæ; Meridionales. Leaves lorate, spread on the ground or arcuate; S. hemisphere.*

5. Caribǽa.—Foliis latè loratis non arcuatis; tubo crasso subtriunciali laciniis breviore.

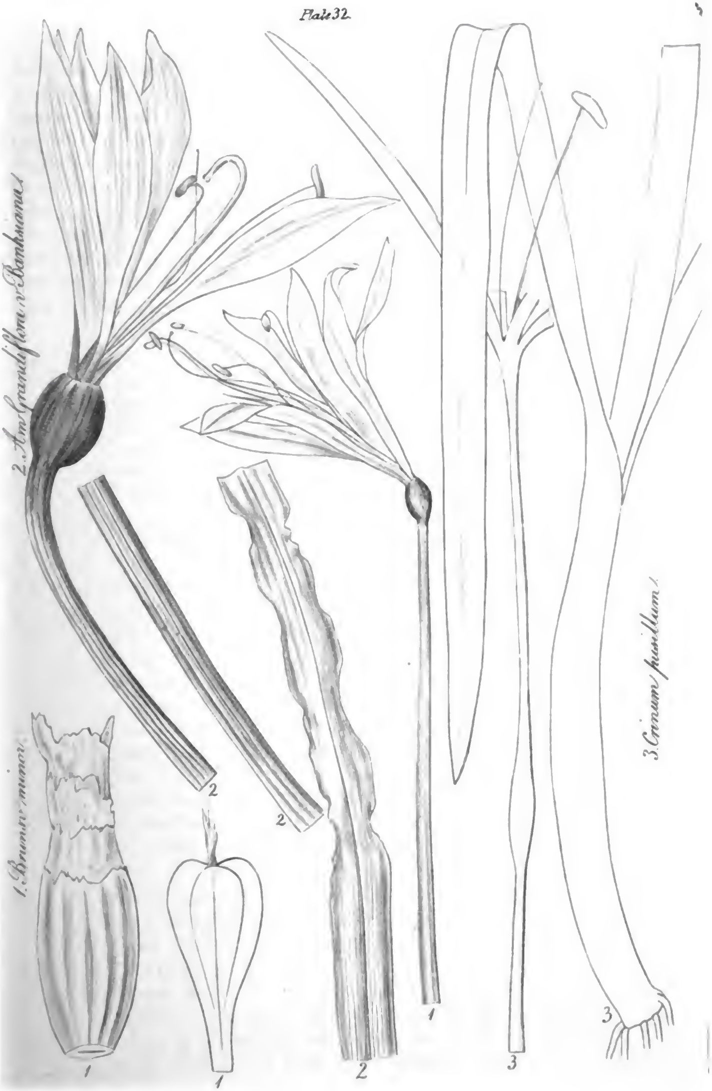
Var. 1. Declináta, vel Princeps.—P. Caribæum. Linn. Sp. pl. ed. 2. 1. 418. Bot. Mag. 21. 826. P. declinatum. Jacq. Am. 51. t. 102. Hort. Vind. 3. 11. t. 10. Red. Lil. 414. Lodd. B. C. 558. Spec. Herb. Banks. Linn. fil. Germen and tube from $2\frac{3}{4}$ths to $3\frac{1}{8}$th long; style longer than the filaments, shorter than or equal to the limb, which is from 4 to $4\frac{1}{2}$ long; leaves broad, very acute, of a very lively green.

Var. 2. Cineráscens; foliis obtusioribus, pallidè cinereo-viridibus, tubo vix 2-unc. limbo $5\frac{1}{2}$-$5\frac{3}{8}$ canaliculato, petalis latioribus, basi undulatis, coronâ $1\frac{1}{4}$ unc., filamentis $3\frac{3}{8}$, stylo $4\frac{3}{4}$, tubum superante. Cinerascens is nowhere figured or described; it is closely akin to the preceding, but has the limb and style much more prolonged; leaves 19-20, 20 inches long, $2\frac{3}{4}$ to 3 inches wide, more obtuse, and of a pale, dull, cinereous green.

Var. 3. Pátens.—P. patens. Red. lil. 380. et nota ad 414. Leaves $1\frac{1}{2}$-3 feet long, 2 inches wide, germen and tube 3 inches long, limb near 4.

I cannot find that there exists in any collection or herbarium such a plant as Patens of Redouté distinct from his Declinatum, which is H. Caribæa, var. 1. or princeps. It seems to be distinguished from that plant as a variety by

Plate 32


2. Am. grandiflora v. Banksiana
1. Brunsv. minor
3. Crinum pusillum
2
2
2
1
1
1
3
3

narrower longer leaves, less proportional length of filaments, less curve of the limb and undulation of the base of the segments, the cup not toothed, the filaments a little shorter than the style. I cannot discover the plant anywhere, and its description rests entirely on the confused account in Redouté. It must be considered a narrow-leaved variety of Caribæa. The name Declinata lapses, being posterior to Caribæa, or it may remain to designate var. 1. from the others. I suppose it was given in allusion to the declension of the scape in seeding, which is common to the whole genus.

6. Expánsa.—Bot. Mag. 44. 1941. Foliis Caribæâ longioribus angustioribus erectioribus, scapo altiore, tubo circiter 4-unciali; Caribææ, si mavis, varietas. The figure of this plant is not a very good one, and there is no other. It is a large vigorous species, allied to the cinerascent variety of Caribæa, with leaves longer, narrower, and more erect, but less arched than those of pedalis and Caymanensis. Leaves from 2 to 2 f. 6, 2 inches to 2⅜ wide, channelled, attenuated below. In a flourishing state it has produced as many as 21 flowers on an umbel; the flowers vary very much in different seasons, according to the temperature, viz. 1816, tube 4¼; 1817, Aug. 4⅛; Nov. 4, 1820, 4¼; 1836, 3¼; limb, 1816, 5¾; 1817, Aug. 5⅛; Nov. 6, 1836, 5; cup, 1817, Aug. 1¼; Nov. 1⅜, 1836. Style exceeding the filaments 2 inches, about equal to the limb. The original bulb was purchased at Mr. Evans's sale, and I distributed many seedlings from it. I have since had from Lima varieties closely allied to it, but differing in foliage, and they will perhaps be multiplied from different localities, till the specific distinction between it and Caribæa will be found to vanish; and in that case it must range as a variety of Caribæa.

7. Tenuiflóra.—(P. litorale? Kunth, 1. 222. ?) Foliis recumbentibus, loratis, 27-uncialibus, 2¼ latis; umbellâ 11-florâ, tubo tenui prope 5 unciali, limbo tenui 4¼, coronâ ¾ unc. This plant was purchased by me at Mr. Evans's sale, 1814; its locality is not known. Its leaves are recumbent, above two feet long, 2½ inches wide at the utmost, flowers 11, tube very slender, 4¾ long, limb slender 4¼, cup ¾ths

wide and long. Rather a delicate plant in the stove. I suspect that it will be found on the coast between Carthagena and Portobello.

8. Angústa.—P. angustum. Bot. Reg. 3. 221. This plant has broader and more arcuate foliage than Tenuiflora, to which it approximates in the slenderness of its flowers, but the tube of its flower is under two inches. It requires a high temperature, and was known in our nurseries by the name of P. litorale, before it was figured under the name Angusta. Mr. Kennedy of the Hammersmith nursery, where it was first introduced, asserted that it was the South American sea-side plant. I entertain very little doubt that either this plant or Tenuiflora is the true litoralis that grows on the island Tierra Bomba, near Carthagena, and on the coast from thence to Portobello; and that Jacquin, by some confusion of labels, has affixed the name erroneously to a Mexican plant. See 12. Adnata. var. 1.

9. Pedális.—P. pedale. Lodd. B. C. 809. Bot. Reg. 19. 1641. fig. non laudandâ, tubo nimis gracili, nisi varietas sit minùs speciosa et mihi ignota. A large species with green arcuate leaves, about 2 feet long, 2 inches wide, acute, attenuated below; robust flowers a foot long, limb about 5, tube 7 inches. Introduced by Mr. Shepherd of the Liverpool garden. Locality not ascertained.

10. Caymanénsis.—P. patens. Lindley Hort. Soc. Tr. 6. 87. non Redouté. Folia saturatè viridia, nitentia, tripedalia, 2½ unc. lata, canaliculata, arcuata, acuta; tubus limbo longior, Caribææ tubo gracilior. Leaves dark glossy green, about 3 feet long, 2½ inches wide, channelled, arcuate, acute. This plant does not agree with Patens of Redouté, which has the tube shorter than the limb. It is a native of the island called Grand Cayman, and has foliage more like that of pedalis than of any other species, the tube longer than the limb, and not so thick as in the Caribæan family, which have all the tube shorter than the limb.

C. *Loratæ, suberectæ; Septentrionales. Leaves lorate, suberect; N. Hemisphere.*

11. Crassifólia.—Ex portu St. Mary, Floridæ Orientalis. lat. circit. 29. Foliis crassis, suberectis, loratis, obtusis, canaliculatis, subtripedalibus, 2-unc. latis, viridibus, perianthii coronâ fere uti in Caribæâ, tubo longiore; bulbo e majoribus. Three bulbs of this species were brought from Florida by Fraser, about twenty years ago; two of them were purchased by myself, the other, as Fraser informed me, was bespoken by Lord Mountnorris; whether it is living, I know not. One of mine was lost by neglect a few years ago; the other flowered the first summer, but never since, nor has it yielded any increase. The inflorescence was sent to Dr. Sims, who, by some mistake, mislaid it, and I had made no memorandum concerning it. Its long erect thick leaves, scarcely attenuated, are very remarkable. It probably requires a cooler temperature than I have ventured to give it.

12. Adnáta.—Laciniarum basi coronæ adnatâ.

Var. 1. Prínceps, vel Litoralis? P. litorale Jacq. Am. 99. t. 179. Hort. Vind. 3. 41. t. 75. Salisbury Linn. Soc. tr. 2. 74. t. 13. P. distychum Bot. Mag. 44. 1879. quoad figuram et Leei plantam. Tubo laciniis longiore. Olim P. Mexicanum hortulanorum.

Var. 2. Driandrína.—P. litorale β. Bot. Mag. 21. 825. P. Dryandri Ker. J. Sc. and A. Tubo 4-unciali laciniis parum longiore.

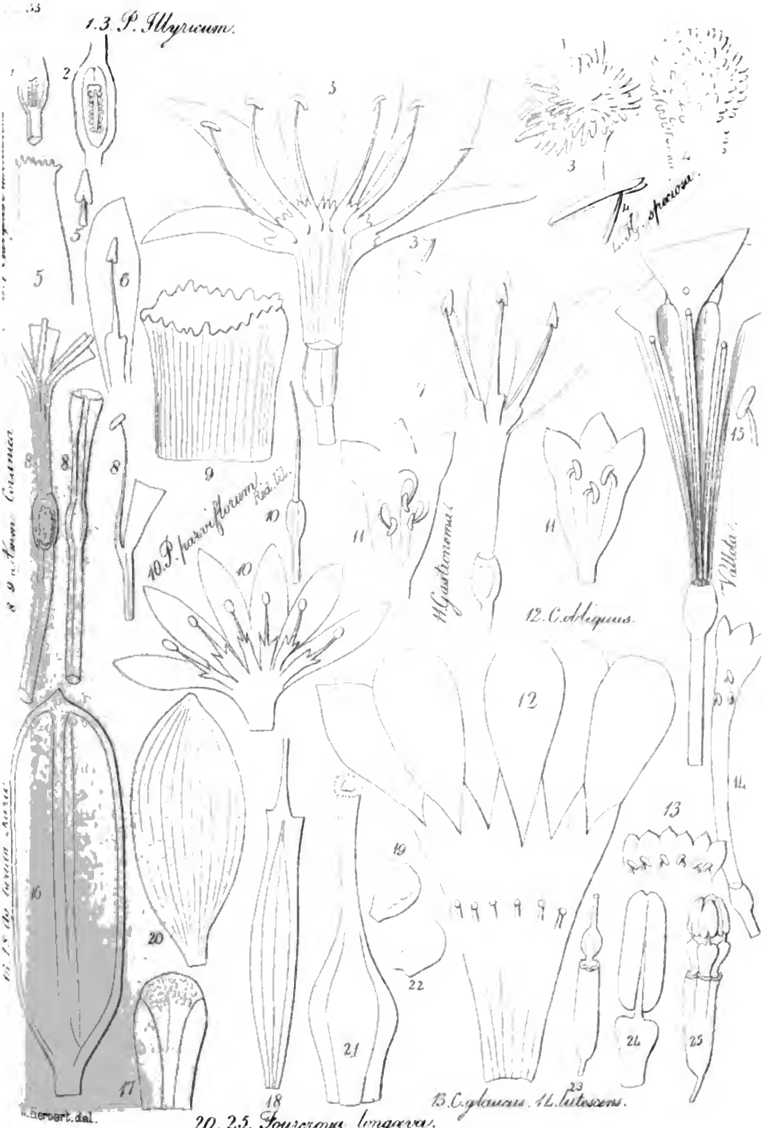
Var. 3. Dístycha.—P. distychum Bot. Mag. 44. 1879. quoad Herberti plantam, non quoad figuram. Tubo et laciniis 4½-uncialibus, foliis parum latioribus nervosioribus.

Var. 4. Acutifólia.—Bot. Mag. 53. 2621. P. Mexicanum Bot. Reg. 11. 940. P. acutifolium. Sweet H. Brit. Tubo 3½ unciali laciniis unciam breviore, foliis angustioribus minùs erectis, stylo perianthium subæquante, filamentis unciam longiore, coronâ 1½ unciali margine denticulato. Patria Mexico.

Var. 5. Staplesiána.—Tubo 3½ unciali laciniis unciam longiore, stylo perianthium æquante filamentis paullulum longiore, coronâ ¾ unc. dentibus magnis

staminiferis; bulbo quàm maximè prolifero, foliis erectis nitentibus bipedalibus, vix unciam latis, canaliculato-costatis, inferne attenuatis.

These are all distinguished from the rest of the genus by the adherence of the lower part of the limb to the cup; they are much hardier than the rest of the genus and are decidedly aquatic or swamp plants. Jacquin has stated positively that var. 1. grows on the island of Tierra Bomba near Carthagena, lat. 11. The identity of his litoralis, as well as that of Mr. Salisbury, with the variety 1. of this species is unquestionable, but I consider it impossible that his statement should be correct that it grows on the sea-level so near the line, or that it can be the plant found by Humboldt between that place and Portobello in the sea-sand. I purchased the plant above 20 years ago at the Hammersmith nursery under the name P. Mexicanum, and Mr. Kennedy asserted it to be from Mexico, and Mr. Loddiges has lately imported many bulbs which appear to be similar, direct from Mexico. It is so hardy that an offset which I set against the front wall of the stove about 14 years ago, grew vigorously there, and although the snow lay upon it some weeks the first winter, its leaves were not killed quite to the ground, and it grew into a tuft with many offsets, and flowers most summers. I lately submerged a pot of seedlings of this variety in a cool cistern in the stove, and the plants immediately began to grow rapidly, and young white fibres formed themselves abundantly on the surface of the earth, and some of them are now floating in the water. Amœna, speciosa, and angusta, planted against the same wall of the stove close beside it, not only perished in the winter, but could not thrive in the summer. I think therefore that I may venture to say that Jacquin must have been deceived by some confusion of labels, and that this plant, which he has called litoralis as growing on the sea-shore in an ardent situation, cannot be the plant that grows there; and that if Angusta and Tenuiflora be not the real inhabitants of that coast, the true litoralis has not yet been introduced into Europe, and is not the plant he has described and represented. If it can grow naturally in such a burning sand, and yet thrive with increased vigour in water in a cool situation, and flourish under snow, it must have a constitution different from that of all other vegetables. I have had this plant with 16 flowers on a scape. Var. 2. and 3. are only distinguished by a little difference of

1.3. P. Illyricum.
3.4. H. speciosa.
8.9. Amm. Cos...
10. P. parviflorum Red. Lil.
11. Gastronema.
12. C. obliquus.
15. Vallota.
16.17. ... Aurea
13. C. glaucus. 14. L. lutescens.
20.25. Fourcroya longaeva.
Seboert del.

tube, which in both is shorter than in the first. Var. 4. has the leaves narrower and less erect than the others. It was sent to Sir Alex. Johnstone direct from Mexico, and is such a decided aquatic, that I have a seedling plant of it now in flower in a cistern, where it has been submerged from a few weeks after it sprouted from the seed some years ago. It is a hardy greenhouse plant, but a little warmth promotes its flowering. Var. 5. was sent to Mr. Tate of Sloane Street, Chelsea, by Mr. Staples, from Mexico. It is remarkable from the multitude of offsets it produces, which rather impede its flowering. It is the hardiest of all the varieties, and having been placed about half a yard from the wall of the stove in front of var. 1. it grows with such luxuriance as almost to overpower the bulbs behind it, forming a very thick and increasing tuft of leaves above two feet high. Some bulbs of it, which were placed in 1835 in a border in the middle of the garden, and covered with a few leaves in the winter, have survived, but seem to want frequent watering; a pot the bulbs set on a step in the pond grows more vigorously. It has flowered and ripened seeds out of doors in front of the stove. I think Mr. Ker was right in stating (Bot. Mag. 27. 1082.) that the P. Mexicanum of Linnæus was a weak specimen of var. 2. of this species, and the name Mexicana, if at all preserved, must belong to some variety of this species. I believe them all to grow in Mexico, and as yet I know of no other species from thence. Litoralis could not be taken as the chief name of the species without absurdity and untruth, and it remains to be ascertained whether it does really belong even to the first variety.

13. Rotáta.—Foliis suberectis subspathulatis 9-20 uncialibus $\frac{1}{2}$-$1\frac{3}{8}$ latis, nitidis, viridibus, scapo 2-4 floro, coronâ magnâ patulâ.

Var. 1. Quadriflóra.—P. rotatum. Bot. Mag. 21. 827. Lodd. B. C. 19. P. Carolinianum Catesby Carol. fig. pessimâ.

Var. 2. Discifórmis; biflora, omni parte minor, coronâ minùs rotatâ. P. Mexicanum. ~~Linn.~~ Ker. J. Sc. and A. cum ic. P. rotatum a. Bot. Mag. 27. 1082. P. disciforme. Red. Lil. 155.

These two plants, the second of which Dryander erroneously supposed to have come from Mexico, where we have no reason to believe it is known, are natives of bogs in the

United States; the latter in Florida, the former extending northwards into Virginia. It is quite evident that the figure of Dryander's P. Mexicanum, published by Mr. Ker, is a bad representation of this plant. It differs in nothing material except the attenuated point of the leaf; and when I look to the incorrect form given to the style and stamens, I can only regard that as another error in the representation. They differ from the rest of the genus in some particulars. Though in a stove or warm greenhouse they will preserve their leaves through the winter, they are more disposed to go to rest at that season, and I believe it is best to leave them dry for a time. The cup is more expanded and green at its base, the seed-vessel is stretched by the growth of the seeds, and does not burst prematurely like the rest, of which the growing seeds become exposed. The young rising leaves of both in the stove or greenhouse perish if a drop of water lodges among them, which makes the difficulty of cultivating them. It has seemed to me lately that the same injury does not take place when the pot stands in a pot of water as when the treatment of the bulb is drier. The flower of var. 1. approximates in form and colour to that of Choretis glauca: it survived a year or two out of doors in front of the stove, but perished without having flowered there. There is a little difference in the form of the cup of var. 2. but they agree in constitution, and every other respect, except size and number of flowers.

Species hybrida.—Spofforthiæ, or Distychâ-rotata. Raised eighteen years ago at Spofforth from rotata var. 1. by adnata var. 3. but has never perfected a flower. The scape comes up always diseased, the flowers dead and discoloured, or in a perishing state. I had despaired of ever seeing it flower, and had suspected that it arose from the barrenness of the mule; but it has occurred to me that it perhaps requires to stand in water at the time of flowering, and the pot is now set in a cistern where the roots are thriving, and I hope that it may be enabled to bring its flowers to perfection.

14. Quitoénsis.—Pl. 22. f. 4. Specim. Ruiz ex Quito. Herb. Lambert. Folia 13-uncialia utrinque attenuata $\frac{3}{8}$ lata, scapus 7-uncialis uniflorus, germen sessile $\frac{3}{4}$ unc. tubus $4\frac{1}{4}$, laciniæ $3\frac{3}{4}$, corona biuncialis ($2\frac{1}{2}$ lata ?), filamenta circiter $\frac{7}{8}$ unc. coronam

superantia, stylo breviora, stigma crassum. This very remarkable plant is only known by Ruiz's specimen in Mr. Lambert's Herbarium. It is the only one-flowered Hymenocallis known, and in other respects it approximates to the Pancratium of the Eastern Continent; so that, from the mere examination of the dry specimen, I do not feel quite confident of its genus. It is barely possible, though not probable, that the Asiatic form of Pancratium may manifest itself on the heights of Quito. The two-flowered Hym. rotata is the species most nearly allied to it, though very inferior in the size of its cup. I much lament the impossibility of obtaining any knowledge of its fruit, and I wish to call the attention of collectors to this plant, and especially to its seeds. I am at a loss to imagine how it could have been supposed in Germany that this plant was allied to Urceolina pendula: it is very remote from it indeed.—Leaves 13 inches, attenuated at both ends, ⅜ths wide; scape 7 inches, one-flowered; germen sessile, ¾ long; tube 4¾, limb 3¾, cup 2 inches long, perhaps 2½ wide; filaments about ⅞ths longer than the cup, shorter than the style; stigma thick.

Species dubia.

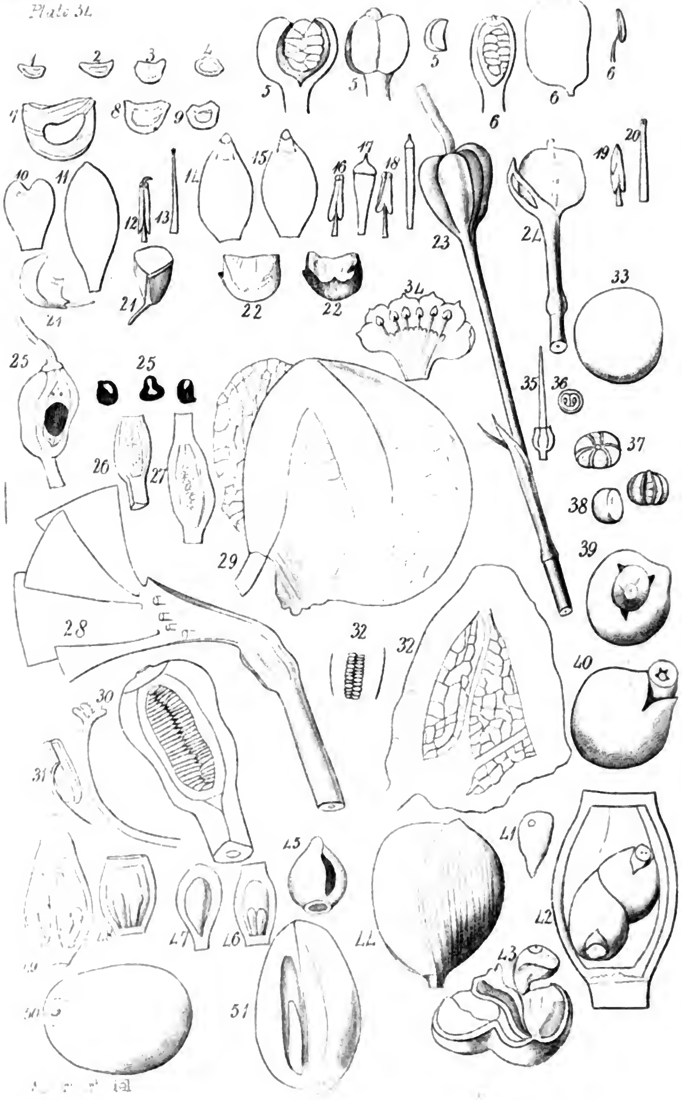
15? Paludósa.—Specim. folii imperf. Tweedie 701. Herb. Hooker. Ex paludibus profundis prope flumen Yazuguay, Rio Grande, Braz. merid. foliis 1¾ unc. latis infra attenuatis (2½ pedalibus?) scapo 2-4 pedali, floribus odoratis 15-20. Hymenocallis, vel Crinum? vel generis nondum noti. Prince Maximilian mentions a white Amaryllis on the banks of the Rio Grande, which is probably this plant, which has a scape from 2 to 4 feet high, and 15 or 20 sweet flowers. No Crinum is known to inhabit America with a scape bearing so many flowers.

55. Chorétis.—Filaments attached to the upper part of the anther in a prominent callosity; anthers recurved at top and bottom.—Seeds short, oblong, i. e. intermediate in form between those of Hymenocallis and Ismene, shorter than the former, but not round, as in

the latter. Perianth of Hymenocallis, habit of Ismene. Scape round (Qu. whether always?) which is two-edged in Hymenocallis. *Natives of Mexico and Texas.*

1. Glaúca. Pl. 35. f. 1. seed Pl. 41. f. 32. Bulbus indusiis nigris; folia erecta, glauca, plùs minùs obtusa, $2\frac{1}{2}$ unc. lata, sesquipedalia; scapus teres, 14 uncialis, 3-(4?) florus; spatha valvis angustis, erectis, sejunctis, biuncialibus; germen sessile, loculis dispermis; tubus viridis, sexuncialis vel ultra; limbus circiter $3\frac{5}{8}$, albus, patulus, sepalis viridi-costatis; corona ultra-uncialis, patula, rotata, alba, maculâ magnâ in medio viridi, dentibus senis magnis reflexis, margine laciniato; filamenta patulo-conniventia, subulata, $1\frac{1}{8}$ uncialia; antheræ apice et basi retroflexis; semina glauca, nitida. This beautiful plant has erect glaucous leaves, $2\frac{1}{2}$ inches wide, obtuse (but not equally so in all individuals), about a foot and a half long; the scape round, with angles nearly obsolete, about 14 inches high; spathe two inches, valves erect, narrow, disjoined, and not covering the umbel; flowers three (or four?) sessile; tube above six inches, green; limb about $3\frac{5}{8}$, white, ribbed with green; cup above an inch long, patent, rotate, with large interstaminear teeth, and a jagged reflex margin; filaments $1\frac{3}{8}$ long, anthers recurved at both ends; cells two-seeded; seeds large, glaucous, smooth. It is a greenhouse plant, liking a very sandy soil, and perfect rest in the autumn and winter, approaching in habit to Ismene, but in the perianth to Hymenocallis rotata. Before I had seen the flower of this plant I entertained no doubt that it would prove to be an Ismene, and when the flower appeared, I had much difficulty in satisfying myself whether it should be considered generically distinct from Hymenocallis or not. I have not been able to learn that such a diversity of anther exists in any well-constituted genus, and particularly the separation of Habenaria from Orchis seems to be very analogous. I have since been fully satisfied of the diversity of this plant by the vegetation of the seeds, which, though sown in May (the plant

Plate 34.



having been forced, to satisfy my impatience), have produced strong dormant bulbs under ground at the bottom of the pot, in the manner of Ismene, which will not vegetate till next year. Hymenocallis, like most other bulbs, forms leaf and bulb at the same time. The genus is perhaps confined to the Mexican dependencies, including Texas. The seeds were obtained by cutting off the rind of the germen and laying open the cells, and, though two of the ovules had a slice cut off in the operation, they did not suffer from the loss, and their growth seemed facilitated by the removal of the rind, which they must otherwise have burst. The scape of this plant was bent downwards every night, and became more erect again in the day time while the flowers lasted.

2. Galvestonénsis.—Pl. 41. f. 34. 35. Specim. Herb. Hooker. (absque foliis) Drummond, 412. ex Galveston bay in prov. Texas. N. lat. 29-30. (f. 36. represents the outline of the upper part of one of the leaves of a bulb sent by Drummond from Texas labelled genus like Crinum, supposed by me to be this plant.) Scapus 9-11 uncialis, spathâ circiter biunciali valvis sejunctis, umbellâ 4-florâ, germine sessili, tubo vix 2½ unciali, limbo 2½-3-unc. stylo vix limbum superante, filamentis unciam brevioribus, coronâ unciali. Flowers four, scape 9-11 inches, spathe 2 inches long, valves disjoined, germen sessile, tube scarce 2½ inches, limb 2½-3 inches, style scarce exceeding it, filaments an inch shorter. There are no leaves to the specimen. On the first sight of Drummond's leafless bulb labelled "Genus like Crinum," without leaf, I pronounced it to be an Ismene, if of any known genus, and probably allied to the plant since named Chor. glauca, but the integuments are much paler, and not black as in that bulb. It produced last spring eight suberect glaucous leaves not vaginating, having been forced early, and it has gone to rest before the end of July as well as Chor. glauca, and I entertain little or no doubt that it is the plant which I have named Choretis Galvestonensis from the specimen in Sir W. Hooker's

herbarium, which is not accompanied by the leaf. It has certainly no immediate affinity to Crinum. I am not sure whether there is a third species amongst Drummond's bulbs, or only a duplicate with a different label. The bulbs are sulky and do not sprout readily before they are well established. The stamen in Drummond's specimen is exactly similar to that of glauca.

56. Isméne.—Filaments deflexedly conniving, ovules erect; seeds fleshy, green, round; bulb ovate; leaves deciduous, linear-lanceolate; tube curved, cylindrical; cup large; stigma obtuse; anther attached scarcely below the middle.

1. Amáncaes.—Pancratium. Bot. Mag. 30. 1224. Leaves acute, sheathing cylindrically; germen sessile; tube green, furrowed, equal to the limb; limb yellow; cup nearly as long, yellow with six green stripes, and bifid jagged intervals.

Var. 1. Bot. Mag. 30. 1224. Limb semipatent, cup cleft into six lobes at the insertion of the filaments; smell unpleasant. Peru.

Var. 2. Limb patent; cup not cleft into lobes, but including the filaments and projecting a quarter of an inch beyond their insertion; scent more agreeable. Peru.

2. Caláthina. Bot. Mag. 53. 2685. Pancratium. Bot. Reg. 3. 215. P. calathiforme Red. lil. 353. Leaves blunter than Amancaes, sheathing cylindrically; germen sessile; tube 4½ inches, green; limb four inches, white; cup three inches, white without, green striped within, with large bifid jagged lobes.

3. Pedunculáta. Tab. 35. f. 2. Bulbo valde prolifero, foliis lætè viridibus; Ismenes Amancaes foliis acutioribus minùs vaginantibus, terræ magis adpressis; scapo foliis longiore, ancipite; germine pedunculato; tubo viridi sesquiunciali; limbo extus virescente, intus albo, biunc. coronâ albâ subvirescente, sesquiunciali, viridi-striatâ; stylo limbum subæquante; odore vix grato. Species frigoris et humiditatis patientior. Peru. Leaves more acute, and not sheathing so high as those of Amancaes; scape

about two feet, pedunculated; tube green, 1½ inch; limb greenish without, white within, two inches; cup greenish and white, with deep green lines, 1½ inch long, with bifid jagged lobes; style equal to the limb.

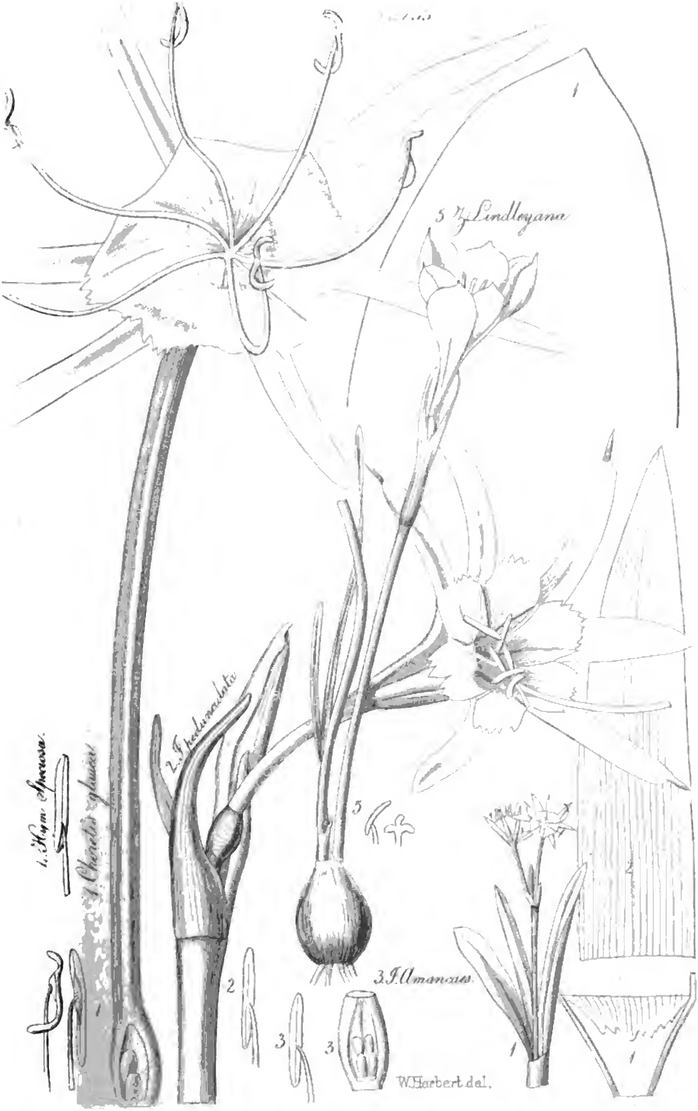
4. Nútans.—Pancratium. Bot. Mag. 38. 1561. Leaves erect, rather spatulate, scarcely vaginating; flowers three or more; germen sessile; tube green, shorter than the limb; limb near 2¾ long, white, equal to the style, ¾ longer than the cup; cup white, dentate and jagged. I believe there is a mistake in the account of this plant having been received from Brazil; at least, bulbs brought by Fraser from E. Florida, which were soon lost by planting them in peat and watering them when at rest, appeared to be this plant. I doubt whether Nutans is preserved in any European collection to this day. I have never seen its flower.

Hybridæ. 1. Spoffórthiæ. Caláthinâ-amancaes. Bot. Reg. 20. 1665. Flore sulphureo.

Absolute rest in winter is essential to this genus, which delights in very light sandy soil; its cultivation is easy when those two requisites are observed. Amancaes seems to thrive best in pure white sand, at least in the vicinity of the bulb. I have flowered it in the open ground by putting a pot full of white sand with the bulbs into the border. Calathina is less particular as to soil, and pedunculata is hardier than either, vegetates in a lower temperature, and flags sooner in hot weather. They should be planted in a border of light compost in April, and the bulbs must be taken up when the leaf is cut by frost in November or sooner, without breaking off the thick fleshy fibres which will endure through the winter after the bulbs are taken up. They must be put in a box or large pot, and covered with dry sand or earth, and kept quite dry till the following April or May. If Amancaes be set in the stove at the beginning of May, and watered, it will flower immediately, and should be removed into a greenhouse as soon as the first bud is ready to expand. The sulphur-coloured mule may be forced as easily. It is a beautiful plant, and has produced flowers in which the expansion of the cup was 3½ inches, and of the limb 5½. Its ovules, three in a cell, are bold, and its pollen seems fertile.

I have obtained this summer strong seedling bulbs from the mule crossed again by the pollen of Amancaes, from which I expect an improved Amancaes with a hardier constitution. The mule seems nearly as vigorous as Calathina. I have also one seedling from a flower of Amancaes which had been deprived of its anthers and touched with the pollen of the mule. The seed of Ismene is large and round, and vegetates immediately in a remarkable manner, forming a bulb as big as itself (sometimes much bigger) far under ground without pushing any leaf. As soon as the seed rots, the young bulb must be left without water till the next spring. A person unaware of the peculiarity of this genus and Choretis, when he found the seed rotten, would be likely to throw away the earth without suspecting the formation of the bulb near the bottom of the pot. If the seedlings of Amancaes are grown in loam, I believe they will be twenty years before they attain size to flower; in pure white sand or a very sandy compost, I think they may flower the third. I have a mule seedling from Amancaes, from seed of last year, which is now near two feet high with five leaves. The seedling bulbs raised this year from the mule are larger than the natural Amancaes from seed that was sown at the same time.

The ovules of Amancaes are sometimes four in a cell, two being abreast, and a second row behind them a little higher, and sometimes three in a file, the base of one behind the head of another, and probably six ovules to the cell may be a perfect complement (two abreast in three tiers), but I have never seen more than four. By removing the sepaline ribs from the germen when the flower withers, the ovules will be discovered, and their advance to maturity may be observed. The name Calathina, being of Greek derivation, should not be accented on the i. Ismene Calathina is said to be a native of Brazil, but I am not satisfied of the correctness of that statement. It has been brought to England from Buenos Ayres, where it is much cultivated in gardens, but its natural locality in S. America has not been ascertained, and it has not found its way into the herbariums of collectors in that quarter, except from the gardens of Buenos Ayres. Mr. Skinner found it wild in Guatemalà, and brought it to this country. I think his plant is less fragrant, and differs a little in the length of the tube and the point of the leaf from that which we obtained from Buenos Ayres, but the difference, if at all permanent, is insignificant.


1. Hym. speciosa.
1. Choretis glauca
2. I. pedunculata
5. I. Lindleyana
3. I. Amancaes
1
2
3
5
W. Herbert del.

Callitháuma ?—Bulb oblong cylindrical; leaves ensiform; limb patent; crown equal to, filaments exceeding, the limb. Not sufficiently known to enable a perfect generic character to be made, but seemingly distinct from all other known plants.

1. Viridiflórum.—Pancratium viridiflorum. Flor. Per. 3. 55. Bulb a palm and half long; leaves long, flat, suberect, diverging; scape the height of a man, or 6 feet; spathe with a white deciduous bracte to each flower; flowers 4-5, large, beautiful, entirely emerald green; cup enormous; segments of the limb acuminate. Plentiful in the woods of Huassahuassi, and on the headlands and stony places of Palca in Peru. Ruiz's specimens of this marvellous plant were lost by shipwreck. It is barely possible that it may be an Ismene, but very improbable.

2 ? Spathulátum.—Bulb large, round; leaves thick, coriaceous, dark green, petiolated, spatulate, deciduous; scape said to be a yard high; flowers large, green. Imported by Richard Harrison, Esq. having been dug from a mountain said to be 500 miles east of Truxillo, but the distance is probably exaggerated. It is probably of a separate genus, intermediate between this plant and Leperiza, with which it agrees in the form of the leaf. It has dwindled in many collections, but thrives pretty well with me in loam. It has not flowered in Europe, nor has any specimen of the flower been received. It seems to like heat.

57. **Calostémma.**—Bulb ovate; leaves linear lorate; umbel many-flowered, pedunculated; germen by defect 1-celled; ovules 2-3; tube cylindrical; limb funnel-shaped; crown often irregularly slit; filaments short, erect; anthers small, erect, attached near the base; style attenuated; stigma simple, small; seeds 1-2, green, fleshy, flattened on one side by contact. Natives of Australia.

1. Purpúreum.—Bot. Reg. 5. 422. Leaves about 15 inches, scape 16-20 flowered; peduncles about an inch long, bracteate; spathe 3-valved; tube $\frac{1}{4}$, limb half an inch, purple, midribs continued down

the tube and germen; 12 triangular teeth to the cup between the filaments; cup often slit in one or more places.

2. Lúteum. — Bot. Reg. 5. 421. Leaves narrower, flowers yellow with green ribs, and six purple spots at the base of the cup; cup with teeth as in Purpureum.

3. A'lbum.—Brown, prod. 298. Flowers white; teeth of the cup linear, emarginate.

58. Vagária.—Leaves linear-lorate; umbel many-flowered, pedunculated; germen roundly triangular, oblong; cup imperfect, filaments dentately winged on each side, inserted at the base of the limb; limb patent; filaments short, alternate; anthers short (incumbent?) style tapering, a little bent; stigma small, slightly trifid.

1. Parviflóra.—Pancratium parviflorum. Red. lil. 8. 471. Desfontaine's Supp. Cat. Hort. Par. It is not known from whence this plant was introduced into the Parisian garden, where it produced its flower stem in the autumn from the centre of the old leaves, which appear to vaginate more than those of Calostemma, or, when the leaves had previously decayed, before the autumnal growth of young foliage. Having seen the cup of Calostemma irregularly slit to the base, though that feature was not observed by Dr. Brown, I felt some doubt whether it might be regularly slit in another species, and in complete ignorance of the ovarium and fruit, as well as the native country, of this plant, there seemed to be a possibility that it might be an Australian Calostemma, differing in that respect, in a wide-expanded limb, a style a little curved, and minute splitting of the stigma. It is however very improbable that an unknown Australian plant should have made its appearance, at the period when this bulb was introduced, in the Parisian garden, and there only, without any record concerning its introduction; and it is much more probable that it will be found to be a native of Spain or Egypt, or some other country bordering on the Mediterranean; in which case it is so

unlikely that an Australian genus should manifest itself there, that we may with safety assume that its fruit will approach to that of Pancratium rather than Calostemma: it is certainly not a Pancratium. The flowers are white within, and mainly green on the outside, approximating to those of Ornithogalum nutans in a kindred order, and I suspect in fructification to P. Illyricum. It has some affinity to Eurycles.

59. Eurýcles.—Bulb ovate; leaves very wide, petiolated; scape scarcely preceding the leaves; spathe 3-valved; umbel many-flowered; germen erect, cells nearly obsolete, 2-(rarely 3-)seeded; tube cylindrical, angles obsolete; limb regular, alternate; segments equal; cup more frequently imperfect; filaments diverging, inserted at the base of the limb, more or less winged, and often scarcely connected at the base by a membrane; anthers short, affixed at the base; style erect, cylindrical; stigma small, fimbriated; one ovule often erect, the other pendulous; seed with two thick fleshy integuments, the bulb usually protruding from the seed in the immature capsule; capsule obovate, 3-ribbed, indehiscent; dissepiments decayed.

1. Amboinénsis.—Pancratium Bot. Mag. 1419. Crinum nervosum L'Herit. S. A. S. Pancr. nervifolium Parad. Lond. 84. Eurycles Salisb. Hort. Soc. Trans. Proiphys. Herb. App. Cepa sylvestris, Rumph. Amboin. 6. 160. t. 70. f. 1. Narcissus. Comm. H. Am. Rudb. Elys.

This plant, a native of Amboyna and the Philippines, is subject to great variation of the crown. It was complete, though deeply cleft, in the specimens figured in the Bot. Mag. and Par. Lond. but was almost obsolete, the filaments being scarcely connected by a thin membrane at the base, in the plant cultivated by me; the filaments, as Mr. Sweet asserts under Eurycles nuda, Hort. Sub. Lond. were not even winged in another variety that flowered at Colvill's, which cannot, however, properly be separated as a species on that account solely, when we look to the intermediate variation. It is a stove plant, requiring rest in winter, and liable to rot if wet gets into the neck of the root. Ovules obovate, dehiscent at the top, with the embryo protruded.

2. Australásica.—Bot. Reg. 9. 715. Eurycles alata. Sweet H. S. L. Calostemma Cuninghami. Hortulanorum. A smaller species from Australia, of which the cup is split to the base, approaching in that respect to the second var. of Amboinensis. It differs however in a much narrower leaf and a hardier constitution, and will live in a greenhouse. I have not seen its flower.

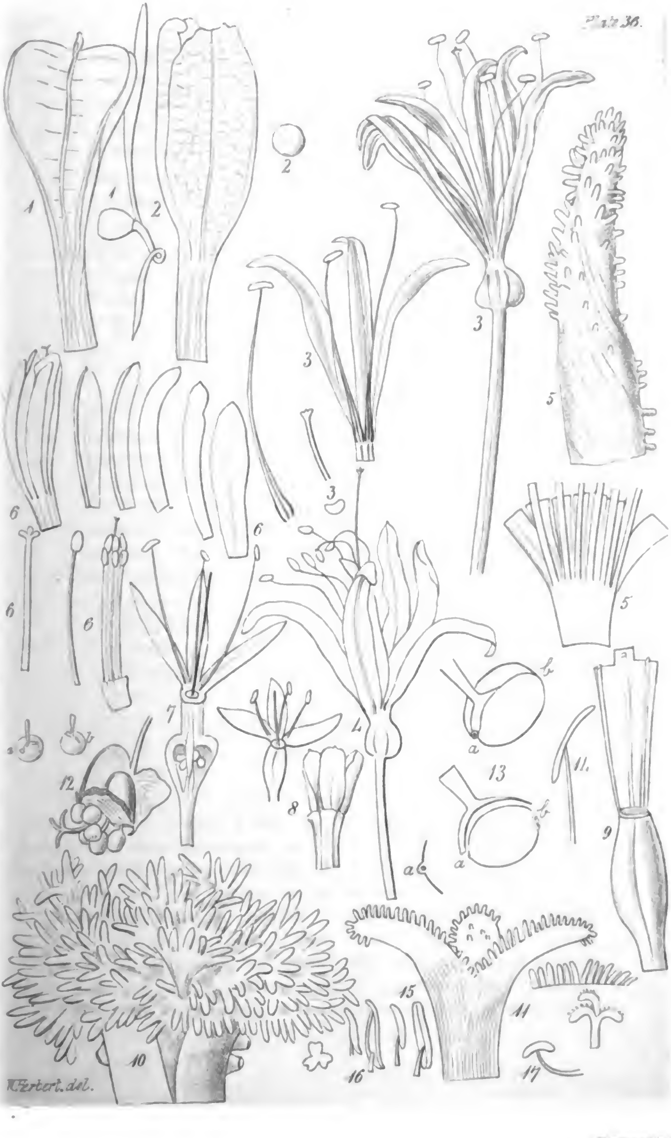
Mr. Salisbury's name Eurycles, being very objectionable, was altered with his consent to Proiphys. Eurycles was derived by him, as he informed me, from the obsolete nominative of the Greek word *kladi*, which however would be *klas*, not *kles*, and means a branch, but never a leaf; and the breadth of the leaf on which he founded the generic name was unsatisfactory for the fundamental feature. I omitted to state in the App. that the alteration was made with Mr. Salisbury's approbation; and, as Eurycles has been since adopted in several works, and has the priority, it seems now advisable to retain it. My friend, Sir W. Hooker, has suggested another derivation for the word, which had not occurred to its framer. Seeds of Crinum and Hymenocallis will often germinate in an over-ripe capsule, as grain sprouts in the ear, and Clivia before the capsule appears quite ripe; but I know of no other instance of the embryo protruded from the ovule at the point furthest from its attachment, and the formation of a bulb proceeding in the immature fruit, which is conspicuous in this genus. It seems however not to be an invariable occurrence, for I received two fresh seeds of Australasica which had not germinated. This genus comes very near to Calostemma, and inhabits the same vicinity.

§. 5. AMARYLLIDIFORMES.—*Scape solid, seeds fleshy.*

60. GRIFFÍNIA.—Leaves wide, petiolated; umbel many-flowered; germen pedunculated; tube cylindrical, declined; segments reflex, the lower divaricate, the lowest stretched forward; filaments decurrent in the tube, recurved; anthers incumbent. Seeds large, roundish, white with a small black chalaza.

1. Hyacínthina.—Bot. Reg. 2. 163. This plant grows in woods on the hills behind Rio Janeiro, eight inches deep in strong loam, the scape and leaves rising to the height of two feet. Cultivated in the

Taf. 36.



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sunny gardens of Rio it only acquires half the size. Potted in our stoves it rots in strong loam, and seems to succeed best in light peat and sand. It cannot thrive in its native soil in a pot, without very good drainage and cautious watering.

2. Intermédia.—Bot. Reg. 12. 990. A plant of intermediate size, introduced by Mr. Harrison. I have never seen it.

3. Parviflóra.—Bot. Reg. 6. 511. A much smaller species, which I never saw but in Mr. Griffin's collection.

This Brazilian genus is allied in leaf to the South American Eucrosia and Urceolina, but in flower it approaches very near to the Asiatic genus Lycoris. The flowers in all the species are purplish blue and white.

61. Lycóris.—Leaves linear, hiemal; umbel many-flowered; germen declined; perianth with tube declined, obsoletely triangular, wider at the mouth, and curved upwards; limb curved upwards; filaments long, recurved, inserted equally at the mouth of the tube; anthers oblong, incumbent; style long, recurved, circumfimbriated near the summit; stigma simple.

1. Aúrea.—Am. aurea. Bot. Mag. 409. Bot. Reg. 8. 611. Jacq. H. Sch. 1. 38. t. 73. Flowers golden. I have a variety of this plant from the Chinese islands, which usually flowers with two supernumerary segments to the flower.

2. Radiáta.—Am. radiata. Bot. Rep. 95. Bot. Reg. 7. 596. Specim. ex Japoniâ. Herb. Lambert. Flowers crimson.

Lycoris ought properly to stand beside Nerine; Brunsvigia is more nearly allied to Nerine, and Griffinia and Lycoris cannot intervene in a consecutive arrangement without interrupting the affinities of the African plants. The leaves of both species are glaucous. They are natives of the extreme East, Aurea of China and the Chinese islands, radiata of Japan. Asia yields its tribute of the genus Crinum, which is remarkable for extending round the whole belt of the world, within and near the tropics; but, with that exception, it produces few plants in this natural order. Lycoris flowers in the autumn, after a period of rest; radiata but rarely in our stoves. It is hardier than aurea, and will live in a green-house. Radiata cultivated at Calcutta, flowers after the hot season, but sometimes fails to yield any blossom for two or three seasons. Aurea likes a light sandy soil.

62. Clívia.—Spathe many-valved; germen pendulous; perianth curved on the upper surface, straighter beneath; tube cylindrical, widened; limb with fourfold diversity; filaments straight, alternately equal, equally decurrent in the tube; style straight; fruit valveless, with a coloured outer coat, and fleshy middle coat, seeds round-oblong, angular by contact, vegetating often in the fruit.

1. Nóbilis.—Bot. Reg. 14. 1182. Imatophyllum Aytoni. Bot. Mag. 55. 2856. Cells 3-seeded; seeds pearl-coloured; flowers numerous, scarlet, tipped with yellow and green; leaves with a harsh margin.

This beautiful plant was first discovered by Dr. Burchell, in whose herbarium, soon after his return from Africa, I saw a fine specimen, which not having been carefully examined, had been mistaken for an Agapanthus, to which its root and leaves have a striking affinity. I soon after became possessed of a plant of this species, brought over by an officer who had been employed on the Caffre frontier, and I recognized it to be the plant I had seen in Dr. Burchell's herbarium, but concluded it to be an Agapanthus. Not long after, I obtained for Mr. Tate, from the kindness of Dr. Burchell, a precise account of the spot where he had seen this plant; the result of which was a large importation of the roots; but after they had vegetated, Mr. Tate mistook them for the common Agapanthus, and was about to dispose of them as such, when I saw them accidentally, and immediately recognized them. One of the plants flowered for the first time in this country in the collection of the Duchess of Northumberland, after whom it was named. By a singular accident it appeared on the same day in the Bot. Reg. and Mag., being named in the latter work Imatophyllum Aytoni, but the name Clivia nobilis has been generally preferred. Sir W. Hooker was mistaken in supposing Mr. Bowie to have been the first discoverer of this plant. Indeed, roots of it were in my hands before he had seen it in Africa. It is a plant of perfectly easy culture, requiring no particular care but to shelter it from frost, and it flowers freely in the greenhouse if placed near a front light, and ripens its seeds; but the seedlings are of very slow growth. The reason of its not having flowered in my collection earlier was that from the slowness of its growth I had been induced to put it in the stove, hoping that it might grow there more freely; but the heat increased its sulkiness. Its berries in a cool greenhouse are sometimes a year ripening; they will hang on a long time after, and on opening them the seeds will often be found to have vegetated within the pericarp. The fruit as figured in the Bot. Mag. is shrivelled and unlike its usual appearance. The ripe pericarp is properly smooth, without furrows, and scarlet, with a juicy pulp between the outer and inner coat like that of Hæmanthus and Tamus; but I have now before me a fruit of Clivia, nearly ripe, in which the seeds have split the pericarp, which is outwardly of a rough brownish green, and instead of juicy pulp has a tough greenish flesh, and will probably never become red and juicy; shewing how easy is the transition from a coloured and juicy to a dry capsule.

This plant has been likened to Cyrtanthus, and a question entertained whether it is distinct from that genus, and Sir W. Hooker says that it has the habit of a Cyrtanthus, but to me it appears to have scarcely any point of resemblance, except the scarlet colour and pendulous posture of some of that genus. Professor Lindley observed its real affinity to Hæmanthus, which it approaches so nearly in its most important features as to have made me hesitate to pronounce that it was not an Hæmanthus, and capable of breeding with species of that genus. Those who likened it to Cyrtanthus did not consider the distinctions of scape, seed, and bulb, nor that Cyrtanthus has the flower with a long wide-mouthed tube and a very short open limb; whereas Clivia has a short close tube and a long limb almost closed at the mouth. The perianth of Clivia has been inconsiderately called tubular, which is not the case, though the segments are closed so as to give a tubular appearance. The most skilful botanists have often failed to consider sufficiently which features are compatible and which are incompatible with identity of genus; but the affinities of plants cannot be determined without such consideration. Many of the points set forth in generic definitions are, in themselves, unimportant, except as being symptomatic of some more essential difference. The distinctions of a hollow or a solid scape, and of seminal structure, are insurmountable barriers, and I believe it to be as impossible for Clivia to breed with a Cyrtanthus or Phycella, to which it has been also likened, as with an oak tree; but when I compare it with Hæmanthus I find such a conformity, that to distinguish it I must rely on a drooping peduncle, an inequality and obliquity of the perianth, the number of ovules, the permanency of its leaves, and the length of time the seeds are ripening; and I can only rely upon such distinctions by judging from analogy that they probably indicate a natural diversity, and I still look to experimental attempts to cross it with Hæmanthus, in order to establish whether they are symptomatic or unimportant features; but when I consider the graduated diversity of form in the genus Hæmanthus, that carneus has a disposition to drooping peduncles, that Puniceus has some obliquity of perianth, that multiflorus and puniceus disagree marvellously from the rest in root and leaf, yet depart from each other and agree respectively with different species in the flower, I cannot look upon the distinction of Clivia with decided confidence, though I believe it to be well founded.

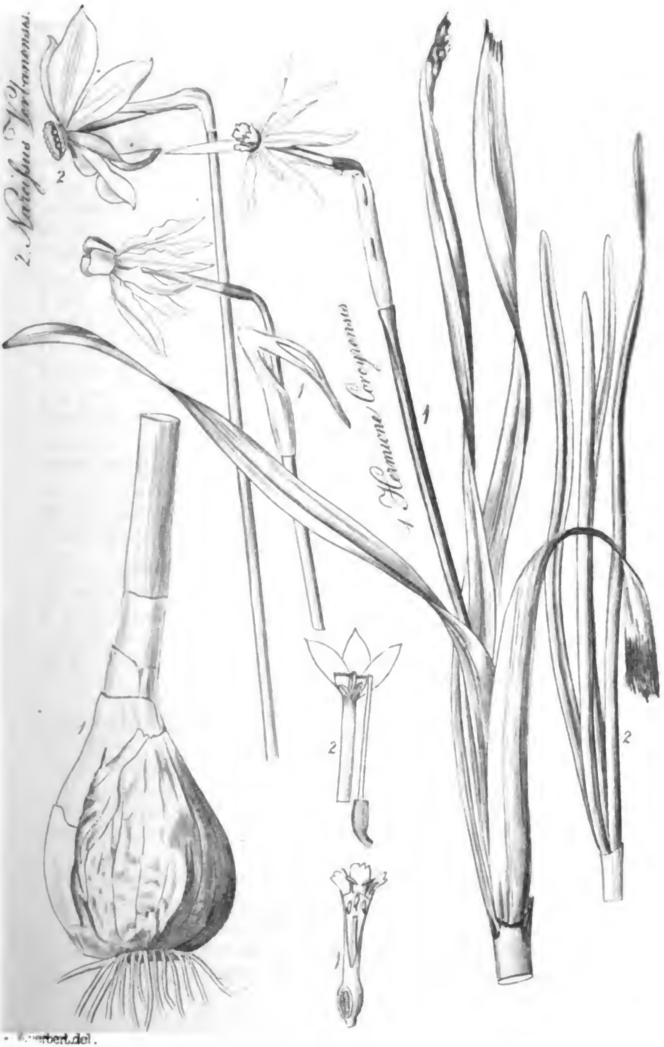
63. HÆMÁNTHUS.—Spathe 3-many-valved; perianth nearly regular, tube straight; filaments straight, inserted in the top of the tube; anthers short, suberect; lobes of stigma three or obsolete; pericarp valveless, furrowless, often coloured, middle coat pulpy; cells with one ovule, dissepiments obsolete.

§. 1. *Bulbo ovato, foliis cylindraceo-vaginantibus, undulatis. Bulb ovate, leaves cylindrically sheathing, undulated.*

A. *Limb patent.*

1. Multiflórus.—Bot. Mag. 24. 961. et 45. 1995. Lodd. B. C. 1948. Spathe 3-leaved, drooping, and withering. Sierra Leone.

2. Abyssínicus.—Specim. Salt. Herb. Lambert. ex Abyssiniâ. Spathâ plurivalvi $1\frac{3}{4}$-unc. purpureâ reflexâ, floribus numerosissimis, pedunc. $1\frac{1}{8}$-unc. floribus H. multifloro dimidio vel ultra minoribus. Many-valved purple reflex spathe, flowers very



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crowded, scarcely half the size of those of multiflorus.

3. Delagoénsis.—Specim. Forbes 101. Herb. Lindl. Spathâ 3 (vel 4?) valvi, 1½-unc. bracteâ unâ ⅜ unc. ¼ unc. lat. cæteris gracilibus; floribus numerosissimis, pedunc. unc. vel ultra, germ. gracili, tubo cylindrico vix ¼ unc. perianthio rubro gracili patente filamentis breviore. From Delogoa Bay.

These two plants seem to form a link between multiflorus and puniceus, and shew that the genus takes a wide range in Africa. It is impossible from the dry specimen to be certain whether the limb is patent as in multiflora or not.

B. *Limb erect.*

4. Puníceus.—Bot. Mag. 32. 1315. Lodd. B. C. 912. Spathe many-valved, green, suberect, persistent; flowers erect, closed, pale yellowish red.

Var. *fortuita.* Subalba. Variety with flowers nearly white, imported by Mr. Lee from the Cape.

§. 2. *Foliis erectis, undulatis; bulbo cylindraceo-ovato. Leaves erect, undulated; bulb cylindrically ovate.*

5. Undulátus.—Pl. 30. fig. 1. Masson. Herb. Banks. Bulbo unc. ⅝ lat. foliis 6-unc. ½ unc. lat. undulatissimis, erectis; scapo 2-unc. spathâ coccineâ, subunc. filamentis alternis stylo longioribus. This curious little plant has lain long unnoticed in the Banks. Herb. having been one of Masson's collection. The inflorescence is almost destroyed, but one flower and part of three valves of a scarlet spathe remain. The bulb seems to approach to that of the first section, and is not imbricated.

§. 3. *Foliis non vaginantibus, non undulatis; bulbo compresso imbricato. Leaves not sheathing, not undulated; bulb compressed, imbricated.*

A. *Limb patent.*

6. Amaryllidioídes.—Jacq. H. Sc. 4. p. 5. t. 408. Two leaves with a red tip, acute, erect, an inch wide, smooth, not spotted; scape 5 inches, pinkish; spathe lanceolate, red with white edges; ped. green, an inch long; germen red; flowers semipatent;

limb scarcely half an inch long, rose-coloured; stigma minute, trifid.

7. Cárneus.—Bot. Reg. 6. 509. Bot. Mag. 61. 3373. H. Roseus. Link enum. 1. p. 309. Leaves broad, hairy all over; spathe withering, not coloured; flowers semipatent, rose-coloured. This species is subject to variation. The bulb figured in the Mag. has longer peduncles and more acute leaves; my bulbs have the leaves obtuse.

8. Strigósus.—Pl. 30. fig. 2. Specim. Masson. Herb. Banks. Foliis binis recumbentibus, 2-unc. $1\frac{3}{8}$ lat. scapo 6-7 unc. spathâ reflexâ $\frac{3}{4}$ unc. 3 (4 ?) valvi, lanc. lin. acutâ, floribus 15-16, ped. $\frac{1}{4}$ unc. perianth. pallidè ? roseo, cum germ. $\frac{3}{8}$, fil. vix brevioribus, stylo vix longiore; stigmate minutè trifido. Another curious plant of Masson's which has been overlooked; allied to carneus.

9. Lanceæfólius.—Jacq. H. Sch. 1. 31. t. 60. Leaves recumbent, ovate, acute, 6 inches by 2, thickly recurvedly ciliate; flowers 7, like pumilio, but smaller.

10. Pumílio.—Jacq. H. Sch. 1. 32. t. 61. Leaves suberect, $\frac{3}{4}$ wide, spotted at the base; spathe large, coloured; flowers 4-5, white, widely patent.

11. Brevifólius.—Pl. 30. fig. 3. Specim. Masson. Herb. Banks. Foliis tribus uncialibus, $\frac{3}{8}$ latis; scapo unciali; spathâ reflexâ, 4-valvi, gracili, acutâ; floribus 10, unà cum germ. $\frac{3}{8}$ unc. albis. This very curious diminutive plant, with three broad leaves an inch long, scape an inch high, pendulous spathe and ten white flowers, is another plant of Masson's. Both this and strigosus have MS. names affixed to the specimens, which were certainly given with an intention of publishing them in the Hort. Kew. Undulatus is named by me.

B. *Limb erect, close.*

12. Húmilis.—Jacq. H. Sch. 4. 6. t. 411. Two leaves six inches by $1\frac{1}{2}$, narrow at the base, strongly ciliated backward, suberect; scape 2-3 inches, pale green; spathe conspicuous, purplish pink; peduncle $\frac{3}{4}$; flowers white, just shorter than the filaments.

13. Viréscens.—Bulbo viridi, foliis pubescentibus vel ciliatis, spathâ non coloratâ, perianthio albescente filamentis breviore. Bulb green, leaves pubescent or ciliated, spathe not coloured, perianth whitish, shorter than the filaments.

Var. 1. Pubéscens.—Bot. Reg. 5. 382. Lodd. B. C. 702. Leaves broad, hairy, varying in obtuseness; spathe many-leaved, green; perianth white, shorter than the stamina and style. In the Banks. Herb. pubescens has the leaf acute, albiflos obtuse. My plant of pubescens has obtuse leaves.

Var. 2. Intermédius.—Bot. Mag. 31. 1239. Leaves smooth, margin villously ciliated, spathe white with green veins; style more prolonged.

Var. 3. A'lbiflos.—Bot. Reg. 12. 984. Jacq. H. Sch. 1. 31. t. 39. Lodd. B. C. 602. Leaves smooth, margin ciliated; spathe whitish; style not prolonged. I suspect that these natural varieties will be found permanent by seed, and that they are distinct in their localities, though properly to be united under one head; but pubescens is not a right name to comprehend the three, though very fit to designate the one which is downy. Their green bulb distinguishes them from all the species I know.

14. Quadriválvis.—Pl. 31. f. 4. Jacq. H. Sch. 1. 30. t. 58. Bot. Mag. 37. 1523. Leaves narrow, acute, spotted (not always) on the base behind, hairy on the surface; scape spotted; spathe large, bright red; perianth red, very close, tipped with white; stigma trifid.

15. Rotundifólius.—Pl. 31. f. 8. Bot. Mag. 1618. Leaves pressed to the ground, large, round, with a rough margin; scape and spathe deep red, 4-valved; perianth pale red with white tips, shorter than stamina and style.

Var. 2. Multiválvis.—Lambertiánus. Martius ap. Schultes. Callosus. Burchell Cat. et tab. pict. Differs in nothing but more valves to the spathe, and a trifling variation of the leaf.

16. Sanguíneus.—Pl. 31. f. 5. Jacq. H. Sch. 4. 4. t.

407. Leaves large, unspotted, when young tipped with red; scape deep red; spathe-valves acute, narrow, veined with deep red; flowers crowded, but not compressed; perianth red, with white tips and base, shorter than filaments; stigma trifid.

17. Hyalocárpus.—Jacq. H. Sch. 4. 5. t. 409. Pl. 31. fig. 9. Leaves broad, not spotted; scape spotted; spathe longer than the flowers, bright red; ped. and germ. each half an inch, pale; limb red, tipped with white; stigma trifid; fruit purplish white. Seed one (represented blackish?)

18. Moschátus.—Pl. 31. f. 7. Jacq. H. Sch. 4. 6. t. 410. Leaves 1½ foot long, 4½ inches wide, at first thinly pubescent, crossed-barred with red below, and deep green upwards; spathe light scarlet; flowers crowded, compressed; ped. and germ. pale green, flower red, tipped with white, close; filaments half an inch longer.

The last five species agree with the next in having the spathe red and the perianth tipped with a white glandular callosity; the two first are widely distinguished by the foliage; the latter have the leaves more nearly allied, but they appear to be distinct.

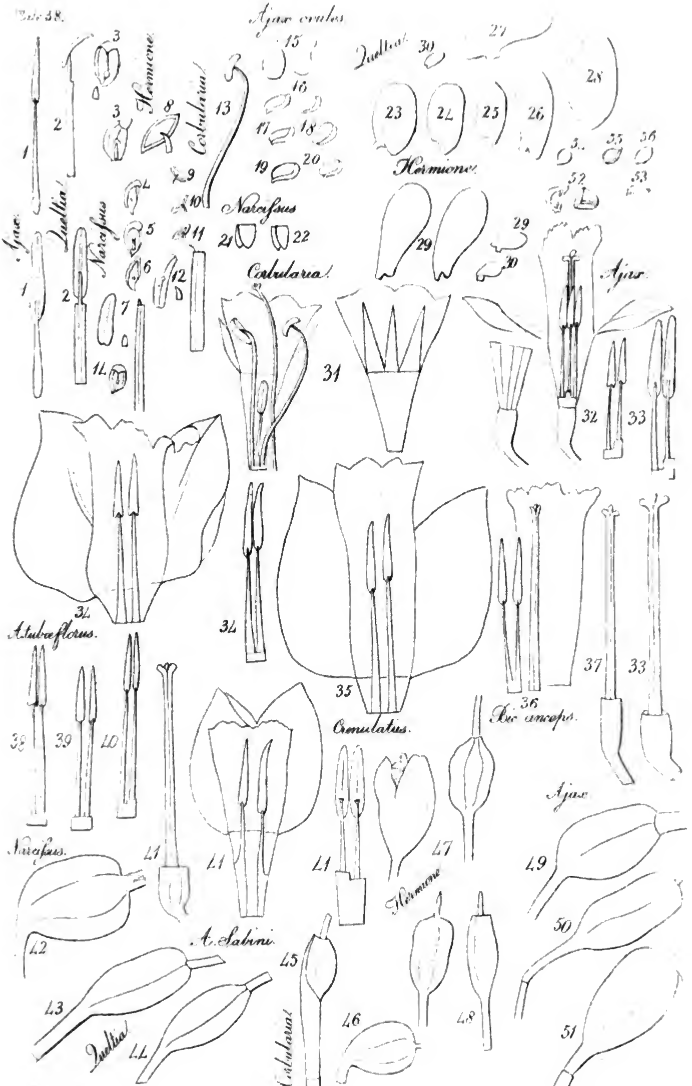
19. Coccíneus.—Foliis rubro apiculatis magnis linguæformibus, umbellâ multivalvi coloratâ floribus sublongiore, limbo rubro apice albo calloso filamentis breviore, scapo maculato.

Var. 1. Grandiválvis.—H. Coccineus. Hort. Kew. Bot. Mag. 27. 1075. Spathe with large deep-red roundish valves; leaves not barred.

Var. 2. Coarctátus.—Pl. 31. f. 6. Jacq. H. Sch. 1. 30. t. 57. Bot. Reg. 3. 181. Spathe close, orange-red or salmon-coloured; perianth dull red, pale at bottom; leaves smaller, not barred.

These agree in foliage, not barred, but tipped, when young, with red, spathe as long as the flowers, limb shorter than the filaments, and tipped with a white callosity.

Var. 3. Carinátus.—Hort. Kew. This plant seems only distinguishable from Coccineus by the leaves being much narrower and more channelled. It has not flowered with me yet, but the particulars recorded


Tab. 38.
Ajax ovules
Queltia
Hermione
Corbularia
Narcissus
Ajax
Queltia
Narcissus
Hermione
Corbularia
Ajax
A. tubaeflorus
Annulatus
Bic. anceps
Ajax
Narcissus
Hermione
A. Sabini
Queltia
Corbularia
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56

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are insufficient to separate it from Coccineus. Leaves much narrower, more channelled, and much longer than those of coarctatus, not barred.

I have four other species or varieties which have not yet flowered, but seem allied to Coccineus. 1. Leaf like coarctatus, with two or three red spots. 2. Leaf closely barred with narrow greenish-red bars towards the base; root given to produce offsets. 3. Leaf barred more rarely with a redder colour. 4. Leaves narrower than grandivalvis, with broad reddish bars. All smooth and tipped with red, which if the flower agree, as I expect, with Coccineus, will make 7 varieties, unless No. 1. should prove to be coarctatus. I have that plant with the spathe not more compressed than grandivalvis. I do not believe that in the native specimens of the latter the spathe is only 4-valved, but many-valved in the same when cultivated, as stated in Hort. Kew.

20. Incarnátus.—Pl. 31. f. 1. Burchell 4556. Tab. pict. 1818. Foliis recumbentibus 7-unc. obtusis obovatis, infra attenuatis, scapo rubro, spathâ multivalvi floribus breviore pallidè rubro, ped. $\frac{3}{8}$ unc. tubo et limbo rubro, stylo limbo longiore filamentis breviore, stigmate minuto. I believe I possess this plant, which is allied to tigrinus, but it has not flowered. Leaves not barred, scape red, flower entirely red, style longer than the limb, shorter than the filaments, stigma small; spathe pale red; valves short and narrow.

21. Tigrínus.—Pl. 31. f. 3. Jacq. H. Sch. 1. 29. t. 56. Bot. Mag. 41. 1705. Leaves ciliated, obovate, very little attenuated; scape green, speckled; spathe red, valves short, narrow; germ. and ped. green; tube white; limb red; style and filaments equal, longer.

22. Cràssipes.—Pl. 31. f. 10. Jacq. H. Sch. 4. 7. t. 412. Leaves closely ciliated, arcuate, 6 inches long, much spotted and barred with red, $1\frac{1}{2}$ wide; scape spotted; spathe broad, scarlet, nearly as long as the flower, which is pale red, shorter than the filaments, stigma trifid. Allied to quadrivalvis, but has not the callous tip or hairy surface.

23. Zebrínus.—Apud me nondum floridus, foliis 8-11-unc. lævibus, obtusis, superne $1\frac{1}{8}$ latis, infra at-

tenuat. $\frac{1}{2}$ unc. lat. dorsò ad dimid. longitud. densissimè, superficie rariùs, clathrato-macul. Species distincta, nisi crassipedis varietas. Leaves 8-11 inches, obtuse, $1\frac{1}{8}$ wide, below only half an inch; closely barred half their length below, less densely on the upper surface, smooth.

24. Cóncolor.—Pl. 31. f. 2. Burchell Herb. B. 276. Foliis lorato-lanceolatis lævibus subacutis 8 unc. $1\frac{3}{8}$ lat. scapo 6 unc. spathâ $1\frac{1}{4}$ rubrâ circ. 8 valvi floribus vix brev. perianthio stylo filamentis concoloribus, filamentis limbo longioribus stylo brevioribus, stigmate trifido. A very desirable small species, being as well as crassipes and quadrivalvis equal to the larger in the inflorescence.

I have lately received from Mr. Loddiges a small Hæmanthus, imported by him from the Cape under the name Coccineus, which has a smooth leaf not an inch wide, and dotted at the base with red, which is probably allied to Concolor. Hæmanthus dubius H. and B. Kunth. must be a Phycella. Hæmanthus vaginatus Thunb. Flor. Cap. from its six linear leaves, and two-valved spathe, does not agree with Hæmanthus, and I entertain no doubt of its belonging to my genus Hessea intermediate between Nerine and Strumaria. It is referred with doubts by Schultes to Brunsvigia, with which it does not agree.

It will be observed that in this genus there is an extraordinary diversity between the first and second section in the bulb, leaf, and habit, such as occurs in no other genus; but I cannot find any diversity in the flower and fruit, and a like variation of species with close and with patent flowers occurs in both divisions. The difference is so great as to raise a doubt whether they form one genus. In the first section the leaves have a long fistulous or hollow cylindrical foot-stalk, which acts as a sheath: in that respect, perhaps, the difference is not much greater than in Amaryllis, of which Blanda vaginates above six inches; but the consequence of this vagination in Hæmanthus is a different form of bulb. That of Hæmanthus has been called imperfect, but I see no imperfection in it. All such bulbs consist of coats, which are the permanent base of the leaves after the upper part has perished. In the species which have only two very broad leaves without a footstalk, the sheathing base is necessarily much wider one way, which makes the shape of the bulb compressed, and not round like those which are formed by leaves that sheath cylindrically; consequently the bulbs of the first section are not compressed, but cylindrically ovate. In all bulbs the outer coats must be stretched by the internal growth of new leaves; when the leaves sheath cylindrically, the neck or orifice being small, the old coats in stretching cannot slip downwards; but, in the second section of Hæmanthus from the breadth of the leaves, which have no cylindrical base, the mouth of the bulb is wide one way; and, as fresh leaves arise, the outer coats, being stretched by the internal growth, drop, and consequently become shorter each year till they decay, which gives an outward appearance of imbrication; but the only structural difference is the leaves not sheathing cylindrically at the mouth of the bulb. The most startling difference is that those of the first section flower with the leaves in vigour, instead of before their appearance. The very singular plant I discovered in the Banks. herb. though in a very imperfect state, with undulated foliage, seems to form a link between the two sections, and it is to be regretted that we cannot obtain a perfect knowledge of it.

64. **Búphane.**—Scape precocious, 100-230 flowered, pedunculated; spathe 2-valved, tube cylindrical, limb expanded, filaments inserted without the tube, erect, diverging; stigma a single point; capsule turbinate, 3-celled, 3-furrowed, 3-valved, few seeded.

1. Dístycha.—Patterson trav. t. 1. Bulbo subrotundo maximo indusiis nigris. Bulbs of this species were imported by Mr. Tate, a few years ago, as large as a man's head.

2. Toxicária.—Brunsv. tox. Bot. Reg. 7. 567. loculis dispermis.

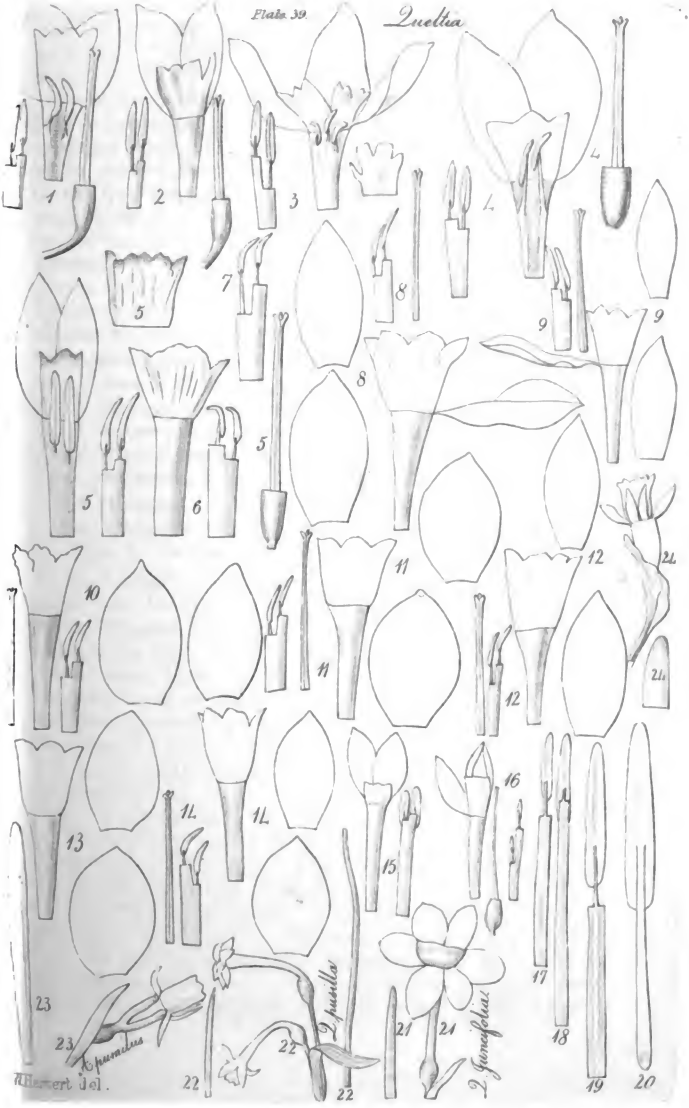
Var. 2. Obtusifólia.—Burchell. herb. et tab. pict. This species varies much in foliage, some having the leaves quite acute, others obtuse, some very little, some much, undulated. Some have the bulb long and cylindrical, others shorter and thicker. It does not appear from Dr. Burchell's drawing that there is any corresponding difference in the inflorescence. The coats of the bulb are pale brown. It is called the poison bulb, and said to be fatal to cattle, from which the generic name is derived.

3. Ciliáris.—Brunsv. Ciliaris. Bot. Reg. 14. 1153. Amaryllis. Linn. Hæmanthus. Willd. This plant has, I believe, never flowered in England, except in the collection of J. H. Slater, Esq. of Newick Park, who appears to have been particularly successful in the treatment of this genus and Brunsvigia. The bulbs of this species rot if not kept perfectly dry in summer, and bleed if exposed to much heat at that time. The only bulb of toxicaria I have seen in flower was cultivated above ground, but so treated they are apt to contract damp from the atmosphere and rot. I believe they should all be grown in light loam, placing white sand in contact with the bulb. Capricious watering is the bane of all such bulbs. They form their leaves naturally in the cool and rainy season, and rest during the period of heat, flowering with the first rains that follow it. It is evident, therefore, that the temperature may be advantageously increased after the leaves are full grown, but heat at their first pushing will make them grow weak and is unnatural to them; they must all have a free supply of water while the leaf is growing, and it must not be allowed to wither prematurely. It has been found, as well as several Mesembryanthemums, growing in clay at the Cape, but it is doubtful whether the evaporation in this country is sufficiently rapid to enable it to thrive in a strong soil here.

4. Guttáta.—Linn. Syst. veg. ed. 13. p. 265. Leaf Herb. Banks. marked Hæmanthus Guttatus, folio 10-unc. unciam lato, infra attenuato, margine spinis semiuncialibus. Pl. 22. fig. 1. I have given the representation of this leaf from a specimen named by Linnæus Amaryllis guttata. After his death, from his notes, it was changed to ciliaris. It may be that he had ascertained by other specimens that it was only a variety of ciliaris; but, although ciliaris varies a little in the form and ciliation of its leaves, I cannot think this narrow attenuated leaf, with such long marginal spines, can belong to the same species. If it prove to be only a variety differing in leaf, it is yet so remarkable as to deserve a sub-

Plate 39.

Queltia



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ordinate name. That given it by Linnæus implies a spotting, as if by drops of water sprinkled on it, which does not belong to Ciliaris.

The leaves in this genus are annual; the peduncles triangular, crowdedly suberect, afterwards diverging to form a spherical head. The perianth is smaller, the stigma more acute, than in Ammocharis. It is placed under Brunsvigia in the Bot. Reg. referring to the character of that genus at p. 192, which is framed with a long string of alternatives, including three differences of seed, and cannot possibly be maintained. The inflorescence of this genus approximates closely to a portion of Hæmanthus, especially H. carneus, but it departs widely from that genus in its fruit, which approaches nearer to Brunsvigia.

65. **Ammócharis.**—Leaves vernal, not sheathing; tube cylindrical, enlarged, sepals not imbricating thereon; filaments adnate at the base of the limb almost equally; anthers short, affixed at the middle; pollen minute; stigma obtuse, one or two lobes obsolete; capsule turbinate, 3-valved, 3-celled, 3-furrowed.

1. Falcáta.—Amar. falc. Bot. Mag. 35. 1443.
2. Coránica.—Am. Coran. Bot. Reg. 2. 139.

Var. 2. Pállida.—Bot. Reg. 15. 1219.

Ammocharis is an intermediate gradation between Buphane and Crinum, differing from the latter in anthers, pollen, capsule, filaments inserted just within, instead of without, the tube, which is wider at the mouth, a shorter proportionate limb, and leaves not sheathing at the base. The particles of its pollen are much smaller. From Buphane it is distinguished by leaves that sprout again identically, like those of Crinum, after a period of rest, the wider mouth of the tube, the insertion of the filaments within the tube, and the difference of the ovules which are more numerous. Those of Ammocharis and Crinum adhere inseparably by one whole side to an intermediate body or placenta; those of Buphane are separately attached, closing together from two threads, instead of proceeding from a solid mass, which is a decisive generic feature. The habits are quite different from those of Amaryllis, Brunsvigia, and Nerine, which flower in autumn before the appearance of their leaves. Ammocharis produces its foliage in the spring, some time before the blossom appears, and lies at rest in the winter.

The seed approaches to that of Crinum. Professor Lindley (Bot. Reg. 1219.) formerly expressed a doubt of the distinction between Ammocharis and Nerine. It will be found, however, on examination that those two genera are very far removed from each other in natural affinity. The genus Nerine is distinguished by characters that cannot be misapprehended, the gibbous monadelphous union of the filaments with the limb which has only an annular connexion. The nearest affinity of Ammocharis is unquestionably to Buphane; that of Nerine to Brunsvigia and Strumaria. The ovules of Nerine do not adhere like those of Ammocharis to an intermediate placenta.

Bulbs of Ammocharis require complete rest in winter, when they must not be watered. They are exceedingly thirsty in summer, and if planted in light earth and left for a short time in the sun without water, the leaves will die back. It is essential, therefore, to supply them constantly with moisture. To make them flower the pot should be plunged, in the summer, in a hotbed after the leaves have grown to some length. In that situation it should be shaded from scorching sunshine, and it should not be kept longer than necessary in the hotbed. A rich and not very light soil is suitable to it in cultivation, and I have found it even succeed pretty well in peat; but I have found the bulbs at all times liable to unexpected rottenness, from incautious watering. It does not seem possible to distinguish falcata from Coranica by the bulb or leaf, yet there is sufficient diversity between their inflorescence to have induced Mr. Ker to place them in different genera, though he was certainly mistaken in so doing. I have found the cells in falcata 6-8-seeded, in Coranica 15-16-seeded. The germen of Coranica has the same angles as falcata, but they are faintly marked, and on the peduncle they become almost obsolete. The difference between them is perhaps sufficient to separate them as species, though it can be only seen in the blossoming.

66. Crínum.—Germen thickest in the middle; tube cylindrical, slender; filaments inserted just outside the tube, more or less recurved; anthers incumbent, versatile; stigma 3-cornered or trifid; capsule soft, deformed, without valves or furrows; dissepiments obsolete. Seeds very irregular in form, size, and number. (Leaves properly tubular at the base.)

§. 1. Patentes.—Flowers patent.

A. *Inclinatæ.—Buds inclined.*

1. *Bulbo longè columnari, foliis divaricantibus, umbellâ numerosâ pedunculatâ. Asiaticæ, et Australasicæ.—Long columnar root-stem, leaves spreading, flowers numerous, pedunculated. Asiatic and Australian.*

1. Asiáticum.—Loculis monospermis. Cells with one ovule. Native of Asia. Perianth white; end of the style and filaments red.

Var. 1. Toxicárium.—Roxb. Hort. Beng. Asiaticum. Bot. Mag. 27. 1073. Leaves acute, tube under 3 inches, limb rather longer; style and peduncle short. A tender plant, and one of the least ornamental. A great bulb of this plant surrounded with offsets was brought from Florida by Fraser, who assured me that he had dug it up on the seaside. It must have been washed on shore from some ship that was bringing it from the east.

Subvar. Mínor.—Ex Sumatrâ. A small variety sent from Sumatra by Sir Stamford Raffles. Leaves acute.

Var. 2. Bracteátum.—Subvar. 1. Brevifólium. Bot. Reg. 4. 179. Jacq. H. Sch. 4. 495. Brevifolium. Hort. Beng. This plant is a native of Mauritius, very like Toxicarium in flower, but smaller, and with very blunt leaves. It is not more bracteate than other species, but the name, Bracteatum, has unfortunately the priority over one more appropriate.

Subvar. 2. Angústius.—An equally small plant, with much narrower leaves, but not less obtuse. Its natural abode is not known, but it had been in the stoves of this country, long before the introduction of the former. It is probably the Sundeep Island variety, which is of easier cultivation at Calcutta than the former; and so is Angustius here. Both have cells with one ovule, and are closely allied to Toxicarium. I have seen the three ovules of this plant fertilized, one taking the lead and growing into the other cells, turning the umbilical cords which were between them to the outside, and by the pressure becoming inseparably united with the two weaker ovules, forming one large pear-shaped mass, with three irregular furrows and a sharp-pointed trifid base.

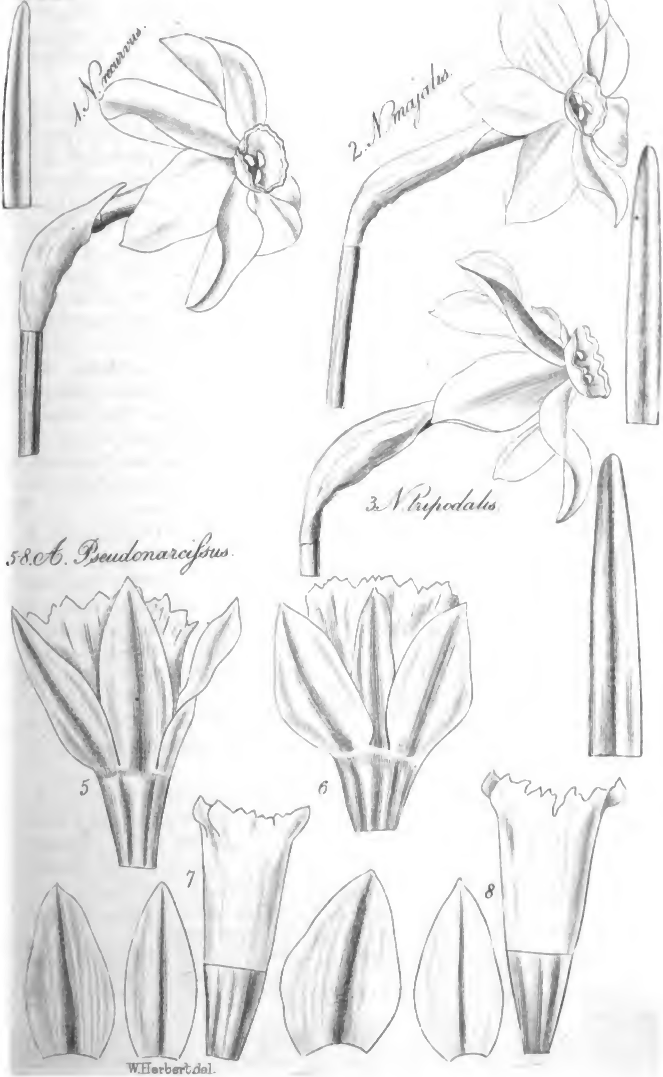
Var. 3. Anómalum.—Herb. App. Bot. Mag. 47. 2121. p. 5. Plicatum. Bot. Mag. 56. 2908. This plant is a native of China. It is very remarkable, because it differs from the whole genus in having the leaves split on opposite sides alternately to the base of the bulb, so that the bulb is imperfect in all its coats. It approximates in the inflorescence to Toxicarium and Bracteatum. The leaves have a strange disease, being, as far as I have seen, always more or less plicate, the plication being sometimes quite monstrous. This will of course be more conspicuous in some seedlings than in others, and it is less observable in the growth of some seasons than of others in the same individual. The tube is usually 1½ inch long, limb 2¼, filaments about an inch shorter; style ½-1½ inch longer than the tube. The leaves are acute. The name Anomalum has the priority.

Var. 4. Declinátum.—Bot. Mag. 48. 2231. This plant has also cells with one ovule, and is closely allied to Toxicarium, but remarkable for the singular manner in which the peduncles detach themselves successively from the cluster and become horizontal, and for the bud nodding, which contravenes the habit of the section, and shews that the division of the inclined and the nodding buds is not decisive. It is a large plant, native of Silhet, with the tube and limb longer than Toxicarium, the outside of the sepals mottled with red.

2. Sínicum.—Roxburgh. Bot. Mag. 47. 2121. p. 7. Foliis 3½ pedalibus saturatè viridibus 5 unc. latis margine undulatissimo, scapo tripedali, germine unciali breviter pedunculato, tubo 4-4½ unc. limbo 4 unc. albo, filamentis stylo longioribus limbo brevioribus. Native of China, from whence it was received by Dr. Roxburgh in 1809.

Subvar. (fortuita) Variegáta; foliis pulcherrimè variegatis. This variety, with beautifully variegated

Plate 40.


1. N. recurvus.
2. N. majalis.
3. N. tripodalis.
5-8. A. Pseudonarcissus.
5
6
7
8

W. Herbert del.

leaves was sent to me by Dr. Carey, but I have lost it. He informed me that a large caterpillar is apt to eat its way into the column of this and other species, and, by the admission of wet into the heart, the plants become variegated through disease, and often die: while in that state I believe they are apt to produce variegated seedlings. The plant I had was very big, grew vigorously with the larger portion of the leaves yellowish white, and did not seem diseased. It was however very sensitive to any wet lodging amongst the leaves, and was killed by it. I have not seen Sinicum in flower, and have no certainty of the number of its ovules, but I have a large drawing of it by an Indian artist, which was sent me by Dr. Carey.

3. Procérum. — Bot. Mag. 53. 2684. According to Dr. Carey, this is the tallest and largest species of Crinum, but it does not manifest its superior size with me, and does not seem to enjoy the confined air of the stove. It is a native of the neighbourhood of Rangoon, and I entertain no doubt of its being one of the parents of C. amabile. This plant increases by the splitting of the columnar bulb into two equal parts, like the Australian family. Its limb is tinged on the outside with red, and the flowers are conspicuous. I neglected to examine its ovules, though indeed it was in flower here this season; but if Sinicum and Procerum should prove to have one-ovuled cells, the above six might be considered as local varieties of Asiaticum.

4. Amábile.—Bot. Mag. 53. 2684. Superbum. Hort. Beng. *Hybridum spontaneum.* Cultivated for its beauty in Sumatra, from whence many bulbs of it were sent by Sir S. Raffles, and where it is said to be found in the interior. Neither Dr. Carey nor Sir S. Raffles ever knew it produce seed. Here it is not only barren, but its pollen is dry, its anthers shrivelled, and it fails to impregnate any other species. It is decidedly a spontaneous cross, probably between Procerum and Zeylanicum.

5. Augústum.—Bot. Mag. 50. 2397. Bot. Reg. 8. 679. *Hybridum spontaneum.* Received at Calcutta from Mauritius, where it is said to be indigenous. Barren like Amabile, and apparently a cross between Bracteatum and Zeylanicum. It is of smaller stature than Amabile, with more obtuse leaves. It is much to be wished that the natural production and reproduction of these two remarkable plants were investigated. We have no certainty whether they are frequently produced, or whether the cultivated plants are all offsets from one respective original.

6. Austrále.—Foliis lævibus sparsis, apice cucullato, scapo multifloro, loculis (quad novi) triovularibus, perianthio albo; stylo sæpissimè filamentis breviore.

Var. 1. Pedunculátum.—Bot. Reg. 1. 52. Brown, Prod. 1. 297. Taitense, Red. Lil. 408. Australe. Donn Cat. Foliis obtusis, germine crasso, tubo 4 unciali, stylo tubum unciam superante. Leaves very blunt; germen thick, tube 4 inches, style an inch longer; column greenish white.

Var. 2. Rubricaúle.—Columnâ et scapo purpurascentibus, germine crasso, tubo viridi 2¾ unc. limbo subæquali (vix triunciali), laciniis albis usque ad ⅜ latis, stylo et filamentis superne purpureis, stylo tubum unc. superante, filamentis unc. breviore. Column and scape purple, tube 2¾ long, limb scarce 3 inches, style an inch longer than the tube, an inch shorter than the filaments.

Var. 3. Exaltátum.—Bot. Mag. 47. 2121. p. 5. Columnâ non coloratâ 15 unciali, foliis 4½ pedalibus, 3-3½ unc. latis, scapo viridi 33 uncias columnam superante, floribus (apud me A. D. 1819, 40.) odoratis, pedunc. uncial. germine gracili (mediâ parte haud multum crassiore) tubo viridi 4 unciali, limbo 2½-2¾ unc. laciniis albis sub-⅜ latis canaliculatis, stylo superne purpureo tubum unciam superante, filamentis apice purpureis semunc. stylo longioribus. Leaves narrower, more acute than pedunculatum; germen slenderer than in any known Crinum, unless perhaps Flaccidum; tube

4 inches, limb 2¾, or less. Purchased by me at Mr. Evans's sale above twenty years ago. Local habitation not ascertained, but evidently belonging to the Australian family, which extends into the islands of the Pacific. Amongst the loftiest of the genus.

Var. 4. Canaliculátum. — Roxburgh. Bot. Mag. 47. 2121. p. 5. Columnâ 9-10-unc. pallidâ vix purpurascente, foliis 3½ pedalibus arcuatioribus, scapo 16-26 unc. pedunc. uncial. vel ultra, germine crasso ¾-unc. tubo 2¼-2½ unc. limbo 3¼-3½ unc. stylo nunc brevissimo, nunc 1½ tubum superante, sæpissimè filamentis ¾ unc. breviore, filamentis 1½ limbo brevioribus. The shortest of the family with leaves acute and more arched, with a shorter tube and longer limb I purchased two bulbs of it at Mr. Evans's sale, and have freely distributed seedlings from them, but have never known it since imported. Precise local habitation not ascertained.

It appears evident that these four natives of Australia and the extreme south-east, although they preserve their peculiarities when raised from seed, may be conveniently united under one general title, preserving the subordinate names to distinguish them. I saw a few years ago a variety in flower at Colvill's nursery, which seemed to exceed them all in general stature, and in the size of the flowers, but I did not make any memorandum concerning it, and I cannot say with certainty whether it differed materially, but I believe not. It was there called, from its large stature, a white Amabile, but I could not learn from whence it had been received. I considered it to have belonged to the Australian family, and to have perhaps found its way there from Kew. If it be forthcoming, and has triovular cells like the rest, it may be called Australe, Maximum, var. 5. The illiberal system established at Kew Gardens by Sir Joseph Banks, whereby the rare plants collected there were hoarded with the most niggard jealousy, and kept as much as possible out of the sight of any inquirer, led in the first instance to a feeling of satisfaction, whenever it was known that the garden had been plundered, and some of its hidden treasures brought into circulation; and the indifference with which such thefts were regarded, if they were not actually winked at, by cultivators, led to such great laxity of conduct, that, until the practice was stopped by a prosecution, every private collection became exposed to like depredations; and the falsehoods, that were told to cover the theft, occasioned a great deal of confusion concerning the native habitation of plants introduced at that period. It was the narrow-minded doctrine of Sir J. Banks, that he could only render the king's collection superior to others by monopolizing its contents; and by so doing he rendered it hateful and contemptible: whereas, if he had freely given and freely received, and made its contents easily accessible to those who were interested in them, it would have been a pleasure and a pride to the nation. It is now near twenty years since I have visited that odious and useless establishment. Formerly I went there often, but always in vain, for if I inquired for any rare plants, which I had reason to believe were in the collection, excepting those which, from their size, could not be concealed, my conductor always denied any knowledge of them; and, if I asked whether I could speak to a person better acquainted with the plants, I was told that I could obtain no further information. The multitude of rare plants that have flourished and perished there unobserved, I believe to be very great. I owe no thanks to that establishment, but for the mere permission to walk straight forward through the houses. I must do Mr. Salisbury the justice to say, that he repeatedly remonstrated with Sir Joseph Banks in vain on the subject.

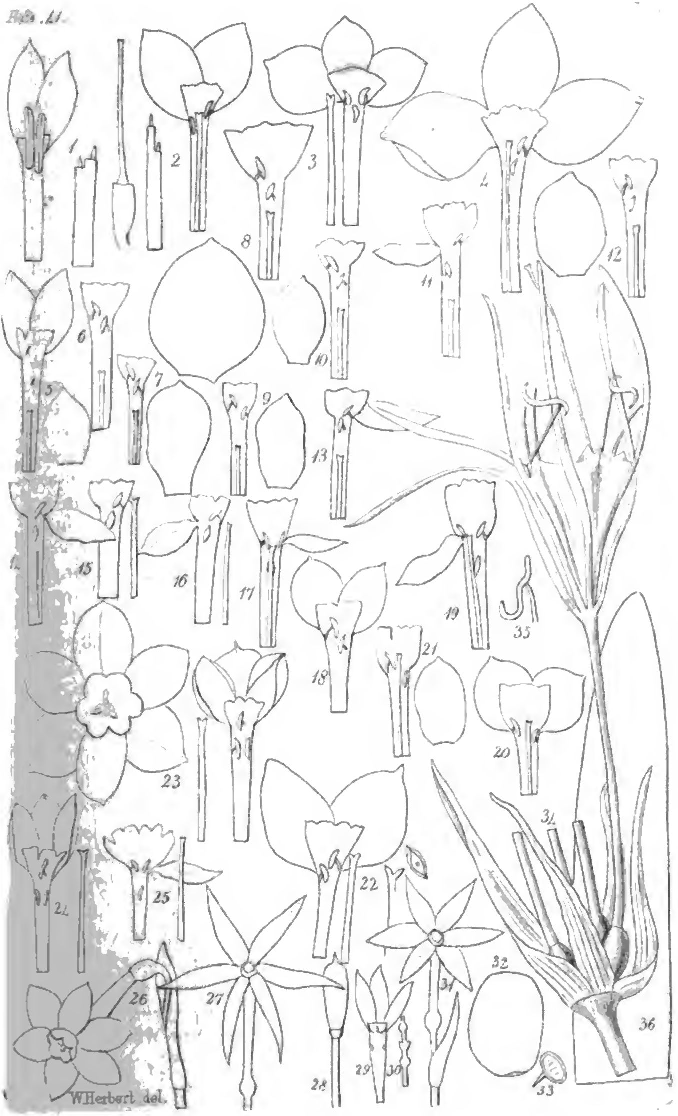
The size of C. pedunculatum and exaltatum is limited, by the column splitting into two equal parts when it has acquired its full growth. That is their mode of increase both here and in cultivation at Calcutta, nor have I ever known them produce a subsidiary offset. I have had Canaliculatum above twenty years, but I have not found it increase in any manner except by seed, which they all bear pretty freely.

2. *Bulbo breviter columnari; foliis suberectis; umbellâ numerosâ subsessili. Asiaticæ.—Bulb short-columnar; leaves suberect; flowers numerous, subsessile. Asiatic.*

7. Rígidum.—Foliis rigidulis, floribus albis.

Var. 1. Sumatránum.—Bot. Reg. 13. 1049. A very remarkable plant with rigid leaves, that give it the appearance of a Yucca. It grows to a great size, though the column is short, and it is not delicate, but it yields no increase, and is unwilling to flower,

Plate .41.



W.Herbert del.

seeming to require a great heat to make it blossom, or perhaps more water than it has been thought prudent to give it. Seeds very large.

Var. 2. Macrocárpon.—Carey. Bot. Mag. 48. 2231. p. 2. Obtained by Dr. Carey from the neighbourhood of Rangoon, but lost soon afterwards. Known to me only by Dr. Carey's letters. Foliis longis rigidis angustis, perianthii laciniis albis latioribus quàm in C. toxicario, seminibus maximis 2 uncias latis. Leaves long, rigid, narrow; segments of the perianth white, wider than those of toxicarium; seeds two inches wide.—The description makes its close affinity to Sumatranum evident.

B. *Nutantes. Buds nodding.*

1. *Bulbo breviter columnari, umbellâ pauciori-florâ sessili. Bulb shortly columnar; flowers fewer, sessile.*

8. Mauritiánum. — Loddiges Bot. Cab. 650. Foliis tripedalibus glabris acutis suberectis apice pendulo, scapo breviore, floribus 4 (vel ultra?) albis rubro apiculatis, stylo staminibus superne rubris longiore. This plant was imported many years ago by Mr. Loddiges from Mauritius, of which it was stated to be a native. It approaches nearer to Brachyandrum than to any other, but is inferior in beauty.

9. Brachyándrum.—Bot. Mag. 47. 2121. p. 8.—48. 2231. p. 2. Columnâ 5-unciali albicante, 3 unc. diam. foliis 20, suberectis, 3-5-pedalibus, vix 2¼ latis, glabris, saturatè viridibus, obtusis uti folia C. defixi; scapo viridi, ultra-bipedali; floribus 11 (*apud me;* 20-30. *Carey*), 7 simul nutantibus, cæteris paullò postea; germine subsessili, tubo 2¾ unc. viridi, laciniis albis, 3½ unc. ⅜ latis; filamentis vix unciam tubo longioribus, recurvatis, rubro apiculatis; stylo unciam longiore, superne rubro, stigmate parvulo albo; loculis dispermis. This remarkable Crinum with two-seeded cells was raised by Dr. Carey from seeds which he received from Australia, certainly within the tropics, and sent to me by him from Calcutta. It flowered at Spofforth in 1821 and two or three seasons successively, never producing more than 11 flowers, but died without yielding any increase, and I fear it has

been lost at Calcutta also. It has no near affinity to C. Australe.

2. *Bulbo ovato breviter columnari, foliis humi divaricantibus, undulatis. Africanæ occidentales. Bulb with a short columnar neck, leaves spreading on the ground, undulated. W. Africa.*

10. Purpuráscens.—Ex insulâ Fernando Po. Afric. occ. Bulbo parvulo ovatè cylindrico, foliis ultra 20 undulatissimis subscabris obscurè viridibus 28 unc. vix unc. latis porrectis apice acutè producto arcuatim depresso, umbellâ 2-9-florâ, scapo purpurascente, spathâ biunciali purpureâ marcescente, germ. subsessili, perianthio ante expansionem nutante saturatè purpureo, dein extus pallidè purpureo intus albo, tubo 5½-6½ unciali, limbo 2½-2⅜, laciniis ¼ latis, filamentis superne purp. stylo parum longioribus, antheris subfuscis polline aureo, stylo purp. tubum 2⅛ unc. superante, stigmate parvo purpureo. The flowers of this singular little African species are 8 or 9 in number, deep purple before expansion, but the colour fades as they open, and they are white within. It is of easy culture and increases fast by offsets, but it is not stoloniferous. The tube is usually above twice as long as the limb.

3. *Bulbo breviter columnari stolonifero, foliis sub-arcuatis, floribus sub-octo. Occidentales. Column short, stoloniferous, leaves rather arched, flowers sessile, not exceeding eight. Occidental plants.*

11. Cruéntum.—Bot. Reg. 2. 171. Two bulbs of this fine plant (which is allied to erubescens, and scarcely distinguishable as a species by its more glossy and erect leaves of a darker green, and the rich purple limb of its flowers, which never exceed six) were purchased by me at Mr. Evans's sale in 1814, and from them all the plants of the species now in cultivation in Europe are descended. It is certainly occidental, and native of a very hot climate, but its exact abode is not known. I find however in Dr. Hooker's herbarium a five-flowered Mexican Crinum with the tube 8 inches long and the limb seeming to have been purple, which

appears to agree with Cruentum except as to the length of the style, which is a variable feature. It is not accompanied by the leaf, but was gathered in the month of August at San Bartolo in Mexican Oaxaca by Mr. Andrieux (No. 74.), and I think it must be a variety (probably a hardier one) of either Cruentum or Loddigesianum. I have a seedling from Cruentum, of which the flower tends a little more to white.

12. Erubéscens.—Folia arcuata margine scabro, spatio inter nervos medios apiculato, perianthio tubuloso, antheris cinereis, polline aureo. Leaves arched, margin rough, with a point prolonged from the space between the two mid veins, tube long, anthers dusky, pollen golden.

Var. 1. Rubrilímbum.—Bot. Mag. 30. 1232. foliis rectioribus 2¼ unc. latis, limbo extus rubescente. Leaves straighter, limb red outside.

Var. 2. Majus.—Foliis altioribus 2½-3-pedalibus, floribus 6-7 majoribus, limbo albo. Leaves larger, flowers 6-7 larger, white. Cells with five ovules.

Var. 3. Minus.—Foliis latis humilioribus, floribus 6, limbo albo. Smaller variety with six white flowers; leaves broader and less erect than var. 1. This was the variety chiefly known in our stoves twenty years ago.

Var. 4. Corantínum.—Foliis rectioribus, superficiè lacunosè subradulosâ, floribus 4 vel ultra limbo lato albo, revoluto; columnâ vix purpurascente. Column greenish; leaves straighter and stiffer than 2 and 3, much pitted on the surface; flowers 4 or more; limb broad, white, and revolute. Introduced by Lee and Kennedy from the banks of the Corantyne river in Dutch Guiana, I believe in Berbice.

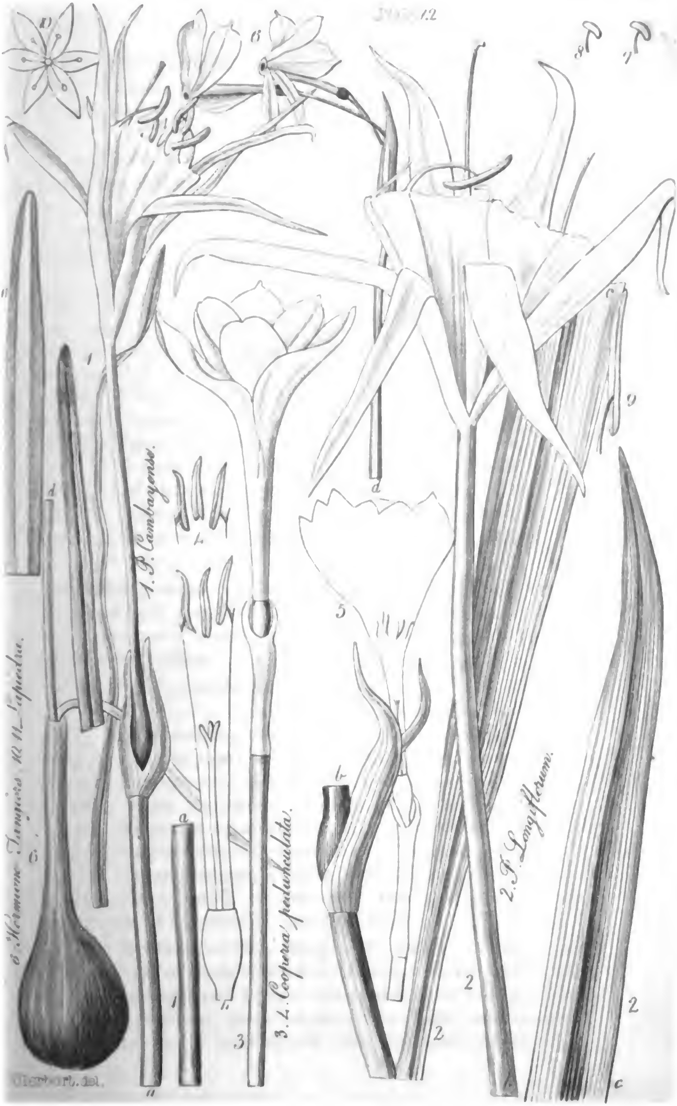
Var. 5. Braziliénse.—Reliq. Willd. Minimum, foliis humilibus, floribus 4 vel ultra albis revolutis. In inundatis prope Rio Janeiro. A small variety with about four revolute white flowers, found by my collector, as described by Willdenow, growing in water (he called it a pond) near Rio. Certainly the mother of C. submersum, which was found in company with it. It was rather impatient of package and cultivation, and the bulbs I had are all lost.

Var. 6. Caraccénse.—Foliis humilibus 17 uncialibus, $2\frac{1}{8}$ latis, margine scaberrimo, floribus albis revolutis; præcedenti valdè affinis. Prope Caraccam. A small variety from Caraccas closely allied to var. 5, but of a stouter constitution; not half so big as var. 3.

Var. 7. Octoflórum.—Bulbo ambitu 14 unciali, foliis $2\frac{1}{2}$ pedalibus, floribus 8 subsessilibus, germine unciali crasso ovali viridi, tubo viridi 4-$5\frac{1}{2}$ unciali, filamentis apice rubris limbo 2 uncias brevioribus, stylo subæquali vel longitudinis incertæ. Ex Venezuelâ. A fine variety lately imported from the Spanish Main by W. Gordon, Esq. of Haffield, affording the only instance yet known of an occidental Crinum of the patent narrow-limbed section producing eight flowers. In all the varieties the flower is more or less revolute at first, at last flaccid and pendulous.

The stoloniferous Crinum erubescens, bearing usually six flowers, but often four in the lesser varieties, and eight in Mr. Gordon's plant, occupies nearly the whole tropical eastern coast of South America. It has a remarkable point to the leaf, which is easily recognised, and before inversion the anthers are of a blackish ash colour.

13. Lindleyánum.—Ex Surinam et Maranham. Erubescens v. viridifolia. Herb. App. Bulbo non purpurascente ovatè columnari, foliis lucidis sesquipedalibus vel ultra, unciam latis vel ultra, margine vix sub lente scabriusculo, lineari-lanceolatis arcuatim porrectis (tubo 6-unciali viridi, limbo revoluto, denique pendulo;—extus purpurascente?) I cannot distinguish Dr. Lindley's revolutum, Hort. Soc. Tr. vi. p. 284, from erubescens, by any thing in his description except greater flatness of leaf. The name revolutum, having been long pre-occupied by another species, cannot remain with it. I believe the plant to be the same as those I possess from Surinam and Maranham, which I formerly


12
1. P. Cambayense.
2. P. Longiflorum.
3. 4. Cooperia pedunculata.
6. Hermione Tempiis 10 11 Papyracea.
Gerbert. del.
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designated as the glabrous green-leaved variety of erubescens. I think it may be separated as having, besides a smooth shining leaf, a more ovate bulb, which is rather disposed to rest from vegetation in winter, being in habit intermediate between erubescens and Americanum. I propose to call it Lindleyanum; whether as a variety of erubescens, or as distinct, may be determined by further examination. It does not flower freely, probably requiring great heat; and, although I have possessed it many years, I have not sufficiently attended to its inflorescence. I describe the leaves from my own plants; the flower from Dr. Lindley's report, under a doubt whether his plant be this, or a variety of erubescens closely akin to Braziliense.

14. Undulátum.—Hooker Ex. Flor. 200. This plant I have never seen, and cannot learn where it is to be found. I did consider it to be one of the varieties of erubescens, but, not having seen its bulb and foliage, I can pronounce no decided opinion. Its flowers are four, white, with the tube 8 inches long.

4. *Bulbo ovato vel sphærico stolonifero, foliis suberectis, umbellâ sessili 4-florâ. Bulb ovate or sphærical, stoloniferous; leaves suberect; flowers four, sessile. Occidental plants.*

15. Loddigesiánum.—Folia non undulata, suberecta, 2½ pedalia, obliquè apiculata, saturatè viridia, margine scabriusculo; scapus 2-uncialis; spatha tubata (an ita semper?) tubus viridis, 8-uncialis, erectus, superne curvatus; limbus 3-3½ uncialis, apice saturatè purpureo, extus purpurâ saturatè striatus; filamenta cum stylo fere æquali saturatè purpurea basi albicantia, 4 declinata, 2 aversa. Ex Mexico. Tube 8 inches, limb tipped with dark purple and striped with the same on the outside. Imported from Mexico by Mr. Loddiges.

16. Strictum.—Bot. Mag. 53. 2635. This plant is intermediate between Loddigesianum and Americanum, and I make no doubt of its being a Mexican plant, from whence Mr. Tate, who sent it to me as it arrived (by some mistake labelled as a

Neottia from Ceylon), imported many plants at the same period. It has no oriental affinities. The name has been altered by R. and Schultes, on account of C. Strictum occurring in Hornemann's catalogue described as having leaves longer than the scape, whereas my strictum had leaves shorter. This is a very variable feature, even in the same bulb at different times, and unfit to make a specific separation; and I find nothing in Hornemann's brief description to mark that his plant may not be the same; but at all events I cannot admit Hornemann's plant at all, for the quarter from whence it was derived is not stated, and it is very likely one of my own hybrid productions, which were freely distributed, and the description is insufficient for a possibility of its being ever recognised. It is a public nuisance to load our books with vague and uncertain species. Rejiciendum est C. strictum Hornem. habitatione incertâ, diagnosi imperfectâ; forsan supradicti varietas, forsan C. Defixum aut Commelinianum vel hybridum hortense.

17. Americánum.—Bot. Mag. 26. 1034. A well known plant with four white flowers exquisitely fragrant. This section might be considered as varieties of one Crinum Americanum, giving the subordinate name odoratissimum to this particular plant; and Cruentum might be properly joined with Erubescens, under the name C. occidentale. I raised a lovely mule between this plant and the narrow-leaved Bracteatum.

18. Commeliniánum.—Jacq. H. Sch. 2. 202. This plant has never been brought to Europe, since its first introduction into the garden at Schœnbrun, and its precise locality is not ascertained. It was brought to this country by my brother, the late Earl of Carnarvon, in his carriage, from the garden of the Grand Duke of Tuscany, being the produce of Jacquin's plant. It increases freely with me by offsets and seeds, preserving its distinct characters, and sometimes bearing only two flowers.

5. *Bulbo elongato stolonifero foliis erectis umbellâ 6-florâ, Asiaticæ. Bulb elongated, stoloniferous, leaves erect, flowers six. Asiatic.*

19. Defixum.—Bot. Mag. 48. 2208. Asiaticum. Roxburgh. Belluta pola tali. Rheede. Mal. p. 75. This little Crinum grows in the wet ditches near Calcutta, and its bulb, sinking deep in the mud, is elongated like a ruler; and Dr. Carey, who sent it to me, could not recognise its ovate green bulb in the engraving, which is the effect of cultivation above ground. It will flower immersed in water, but does not require it, and increases freely by runners. The seed is longer than usual in the genus.

20. Ensifólium.—Bot. Mag. 49. 2301. Cells with two ovules. A native of Pegu, closely allied to Defixum, with more acute leaves and flowers redder on the outside, and of a much more delicate constitution. Dr. Carey had lost it at Calcutta, and I sent back to him, a year before his death, one of two bulbs I possessed. This and the one preceding it might be united under a superior name, C. Scrobense, or ditch Crinum.

21. Pusíllum.—Pl. 32. fig. 3. Specim ex insulis Nicobar. Herb. Linn. Soc. et Herb. Banks. Bulbo columnari cylindrico 4 unc. vix. $\frac{3}{8}$ diam. foliis acutis 9 unc. $\frac{5}{16}$ latis. pedunculis $1\frac{1}{2}$ unc. germine gracili $\frac{3}{4}$ unc. tubo et limbo triuncialibus, stylo et filamentis subæqualibus, plus unc. limbo brevioribus. I conjecture that this singular little plant must be a stoloniferous ditch Crinum like Defixum, and that its little columnar bulb would contract its length if cultivated above ground: it differs from the two last in having long peduncles.

6. *Bulbo sphærico vel ovato, foliis semirecumbentibus. Bulb sphærical or ovate; leaves half-recumbent.*

22. Amœnum.—Roxburgh. M. S. cum tab. pict. Ker J. Sc. & A. bulb round, without elongated neck; leaves 1-2 feet, $1\frac{1}{2}$ inch wide, a little channelled; margin slightly scabrous; flowers white, 4-8, sessile, tube 3-4 inches, limb about equal. From Silhet. Found also in Nepal and the Birman empire. Cells with 5 ovules.

Var. 2.—Caudíceum.—From Ceylon. Bulb round with an elongated neck; leaves gradually attenuated;

flowers 10, subsessile; tube 3½, of which 2½ are persistent; limb 3 inches; style ¼ an inch; filaments an inch shorter than the limb; cells with 5 ovules.

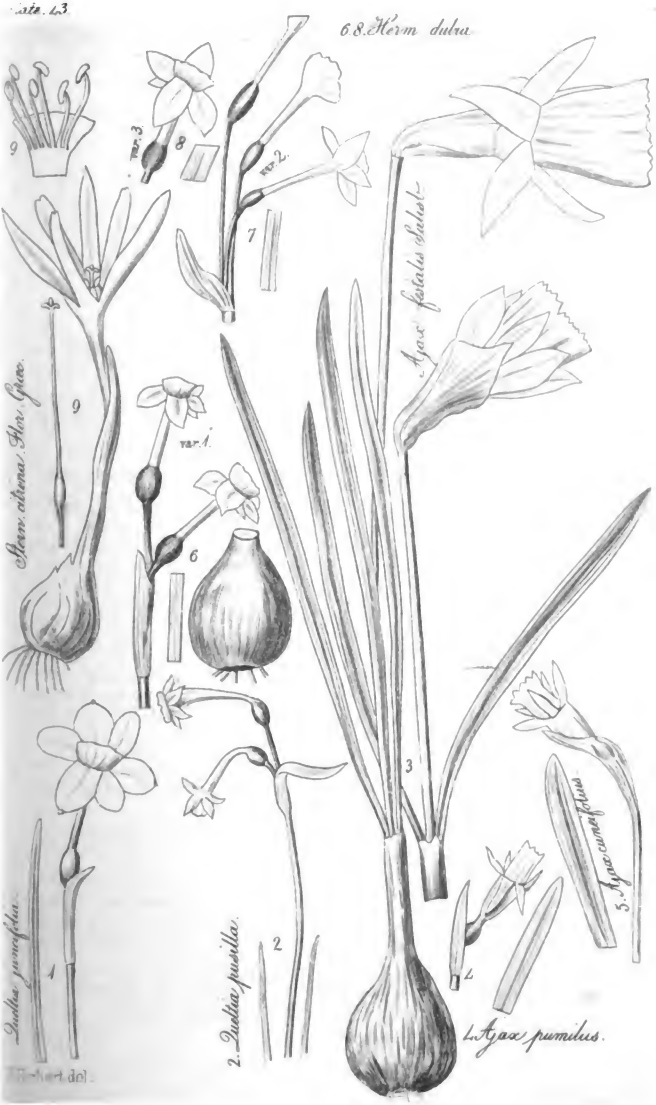
These plants increase by the bulb splitting in halves. They are very thirsty while growing in heat, and I think flower most freely when they are left dry in the winter. Dr. Carey sent me a bulb he had received from Rangoon, which he had named Verecundum, stating that, though it approached very near to Amœnum in foliage, it was distinct in its inflorescence. I have not seen its flower, and am not satisfied of its diversity, or sufficiently acquainted with its peculiarities, to think it right to give it a separate place as a species.

Var. 3. Verecúndum.—Amœnum, var. 2. Herb. app. Bulbo sphærico foliis humifusis saturatè viridibus, lacunosis, obtusioribus, margine lævi.

23. Húmile.—Bot. Mag. 53. 2636. Leaves short, acute, pitted; flowers pedunculated. A very small species from the extreme East; brought to England in an Indiaman by Capt. Craigie, but it was not ascertained where it was taken in. Not known at Calcutta.

24. Praténse.—Bulbo ovato vel sphærico, foliis loratis flaccidè recumbentibus, umbellâ sessili multiflorâ. In pratis siccis prope flumina proveniens, inundationis annuæ tempestate florens umbellâ natante.

Var. 1. Longifólium.—Roxburgh. Ker J. Sc. and A. Leaves 2-3 feet long, 2 inches wide; flowers subsessile 8-12, white; tube 4 inches, limb a little shorter; filaments and style nearly equal with the limb; anthers before inversion brown. Bengal. Floruit Altaclaræ in Britanniâ A. D. 1822, floribus 10 ante expansionem nutantibus, spathâ majore non marcescente, germine subsessili, in medio umbellæ semunciam pedunculato, tubo viridi graciliore q. in lorifolio, 4 unciali, laciniis 3 unc. vix semunc. latis acutioribus, stylo filamentis et limbo brevioribus superne rubris ¾ unc. longiore, debili, recumbente, rubro, stigmate minùs quam in lorifolio fimbriato, antheris ante inversionem fuscis, scapo rigidiore erecto, germine longiore crassiore, umbellâ diffusiore.


ate. 43
6.8. Herm. dubia
9
var. 3
8
var. 2
7
Herm. citrina. Flor. Græc.
9
var. 1.
6
3
Ajax festalis Salisb.
5. Ajax cuneiflorus
4
4. Ajax pumilus.
2
2. Queltia pusilla.
1
Queltia juncifolia
hart del.

Var. 2. Lorifólium.—Roxburgh. Ker. J. Sc. and A. Leaves 2-5 feet long, scarcely distinguishable from longifolium, the margin of both a little scabrous. Flowers sometimes 20, less pedunculated than in longifolium (which is contrary to Dr. Roxburgh's observation). Pegu. Floruit. A.D. 1822. floribus 8, spathâ parvulâ marcescente, pedunculis brevibus, tubo viridi 3 unciali, laciniis 2½ unc. longis, ½ unc. latis, filamentis albis lacinias æquantibus, antheris fuscis, stylo superne rubro, stigmate conspicùe fimbriato trifido, bracteis fugacioribus, scapo recumbente umbellâ erectâ confertâ, germine vix pedunculo crassiore.

The following particulars of the inflorescence of longifolium and lorifolium will establish their diversity, though they can scarcely be distinguished from each other when not in flower:—

Lorifolium.	*Longifolium.*
Scape reclining quite horizontally.	Scape more rigid, upright, less compressed.
Umbel turning up at right angles to the scape or nearly so, compact, 8-flowered, buds nearly erect.	Umbel more diffuse, 10-flowered, buds nodding.
Peduncles extremely short, except in the middle of the umbel; becoming afterwards more elongated than in longifolium.	Peduncles extremely short, some becoming afterwards half an inch long, other germs remaining nearly sessile.
Germen scarcely thicker than the peduncle.	Germen longer and thicker than in lorifolium.
Bractes small, very slender, thread-like, fading when the umbel expands.	Bractes slender, green, more persistent.
Spathe small, soon withering.	Spathe larger, firmer, more durable.
Tube green, 3 inches long.	Tube green, slenderer, 4 inches long.
Limb 2½ inches long; segments ½ inch broad, blunt at the point, white.	Limb 3 inches long; segments not quite half an inch wide, more acute, white.
Filaments equal to the limb, pure white, conniving.	Filaments shorter than the limb, slender, straighter, erect; upper half red.
Anthers brown; stigma trifid, conspicuously fimbriated.	Anthers brown; stigma not conspicuously fimbriated.
Style equalling the filaments, erect, upper half red.	Style ¾ths of an inch longer than the filaments, slender, recumbent, all red.

Var. 3. E'legans.—Bot. Mag. 52. 2592. from Rangoon. Closely allied to the two former, with flowers less

disposed to be pedunculated, and a more elongated bulb; scape recumbent. In longifolium the style is red, the filaments tipped with red, in the two others the filaments white and the style tipped with red. The tube of elegans is 2½ inches, and shorter than the limb which is 3½; in longifolium the tube 4 and the limb only 3, in lorifolium the tube 3 and the limb only 2½. From Rangoon. It increases by the bulb splitting in halves.

Var. 4. Venústum.—Carey. Herb. App. From Silhet. Leaves more obtuse than elegans; flowers about 30, entirely white, about the size and form of those of longifolium.

Var. 5. Canalifólium.—Carey. Herb. App. Leaves an inch wide, more channelled than the three former, rather tending to glaucous; flowers about 10, pale red on the outside.

The two former grow in meadows near the great rivers of India, on sound turf, liable to inundation, and in the flood season their leaves are elongated, and they flower with the umbel floating like a water-lily. It is evident from the sloping scape of elegans that its habits are similar, and I have no doubt that the two others have the same. They are difficult to cultivate, because they are impatient of continued moisture, and it is difficult to accommodate them with the luxury of a dry sod and a seasonable inundation. They are so evidently akin to each other that I thought they might be conveniently brought together under the superior name of Meadow Crinum. They will not long exist in light earth, and should be planted in rich and pretty strong alluvial soil.

25. Erythrophýllum.—Carey. Bot. Mag. 47. 2121. p. 7. Ex Rangoon, foliis saturatè sanguineis. Dr. Carey lost this remarkable plant without having seen its flower, and vainly attempted to obtain it and Macrocarpon again. There is no doubt of its being a distinct species, but I cannot tell what are its affinities. Leaves as red as those of a red cabbage.

26. Grácile.—Meyer Rel. Hank. p. 120. Ex insulâ Luzon. Known only by Meyer's description from a Manilla specimen. Leaves lanceolate, 1½ foot

long, 1½ inch wide, attenuated at both ends; scape a foot; spathe obtuse, 1½ inch; flowers 6-7; tube more than twice as long as the limb; filaments ⅓rd shorter than the limb, rather declined, recurved. Perhaps allied to the following Australian group.

27. Australásicum.—Bulbo sphærico, foliis crassis rigidulis, filamentis basi gibbosâ, germine sessili, subsessili, vel breviter pedunculato.

Var. 1. Arenárium.—Bot. Mag. 49. 2355. Leaves with the margin slightly scabrous, peduncle ⅜ long, tube near 4 inches, pale green, limb white 2¾; filaments and style purple upwards; style longest, shorter than the limb. Cells with six ovules.

Var. 2. Blándum.—Arenarium β. Bot. Mag. 49. 2535. Leaves larger, peduncles longer, limb broader, blush-coloured without, filaments white, style red upwards, much longer, stigma much smaller than in arenarium.

These were found growing in Water Island, lat. 14° 3′ south long. 150° east of Greenwich, 10 inches below the surface of a barren sandy soil; thermometer in the shade, sea-breeze blowing, 94° Fahr.; heat of the sand 130° near the surface.

Var. 3. Confértum.—Bot. Mag. 51. 2522. Leaf narrower than the former, with a smooth margin, flowers sessile, cells with 5-8 ovules, tube erect, 3 inches long, shorter, red, white at the base. Sent to England under the name Angustifolium.

Var. 4. Angustifólium.—Brown Prodromus. 1. 297. Foliis margine scabro. I am not aware from Dr. Brown's short description that it differs from confertum in anything but a scabrous margin to the leaf, but on comparison of the leaf of confertum with Dr. Brown's specimen that difference was very apparent. I have seen no bulb of the true angustifolium.

28. Venósum.—Brown Prodromus. 1. 297. Germen subsessile, tube twice as long as the limb, segments strongly veined elliptic-lanceolate, filaments half the length of the limb, anthers equal to the filaments; leaves unknown. This plant being insuf-

ficiently described, I cannot determine whether it is allied to the foregoing group, or to 9. Brachyandrum.

§. 2. Semipatentia.—Half-patent.

A. *Foliis sæpius undulatis, umbellá* 1-20-*florá, laciniis latis, germ. sess. vel subsess.—Leaves usually undulated; umbel* 1-20-*flowered, segments broad*; *germen sessile or subsessile.*

29. Broussonetiánum.—Bot. Mag. 47. 2121.

Var. 2. Pluriflórum.—Parad. Londin. 52. C. Yuccæflorum.

Var. 3. Yuccæídes.—Foliis non undulatis. Spec. in Herb. Soc. Linn.

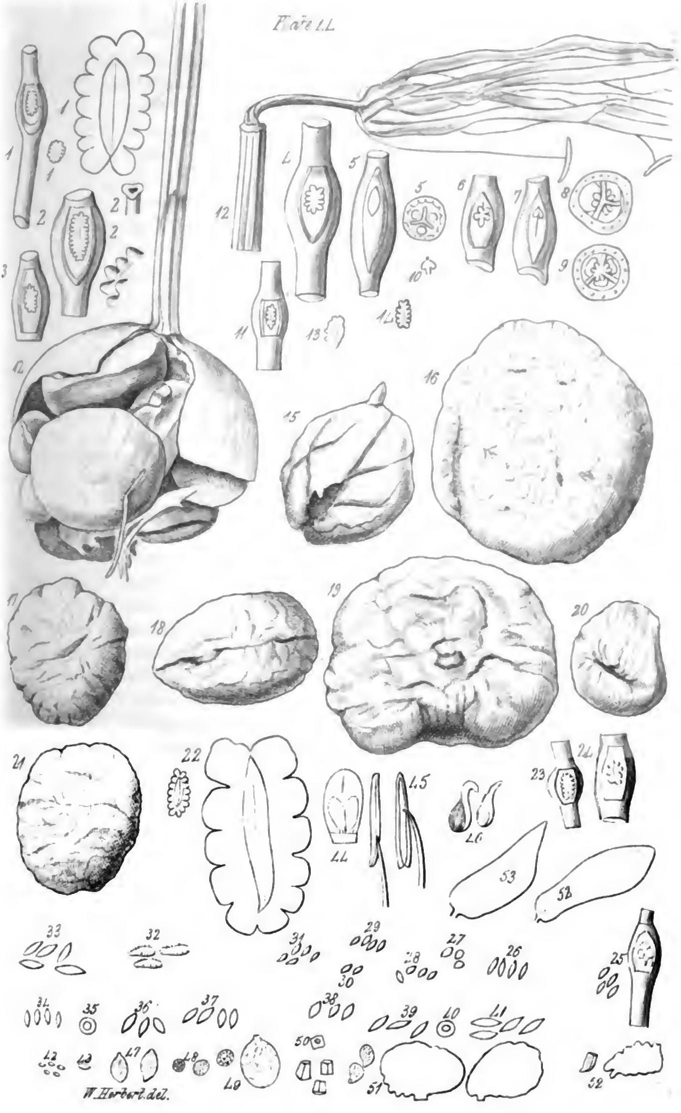
The first of these produces usually a solitary flower, with a fine purple stripe on each segment, the second two or more; the third variety, which is more delicate, has the leaves not undulated, the flowers two or more. They are all natives of Sierra Leone, and not materially distinguishable. It is advisable to leave them dry in the winter. Probably from some constitutional difference I failed in one or two attempts to cross this species with Capense, which shews no disinclination to breed with any Crinum of Asia or America.

30. Dístychum.—Am. Ornata. *a*. Bot. Mag. 31. 1253. This little plant, a native also of Sierra Leone, differs from all the rest of the genus in having leaves not multifarious, but alternating to the right and left; and, contrary to the prevailing habit of this section, they are not undulated. It produces usually a solitary flower, striped with red, and is allied to Broussonetianum.

31. Petiolátum.—*Foliis latis petiolatis, costosis, nervis vix parallelis ex costá oriundis, floribus albis, umbellá sub-8-florá.*

Var. 1. Spectábile.—A. ornata. β. Bot. Mag. 923. C. Giganteum And. Rep. 169. This fine species with broad and large conspicuous white flowers, is a native of the tropical west coast of Africa. The name, giganteum, has the priority, but it would be disgraceful to science to retain the name gigantic for a species of inferior size. Such names, as this and Thunbergia fragrans for a scentless plant, must be altered, being much more objectionable

Taf. 14.



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than those rejected by Linnæus as too complex; but it is only where a specific name announces an untruth that I would countenance its rejection. The name spectabile occurs in Lodd. Cat. and elsewhere. I understand that it grows in ditches in an island, called, I believe, St. Thomas, on the west coast of Africa.

Var. 2. E'xtorre.—Foliis sub-angustioribus, nitentioribus, erectioribus, undulatissimis. Leaves rather narrower, more shining, erect, and undulated. Found by my collector growing near the sea in the neighbourhood of Rio Janeiro. It is a more thirsty plant than the African, and requires the earth to be always moist. I cannot tell whether it be a variety from the African plant introduced into Brazilian gardens and naturalized in the vicinity, or an ancient native of the west.

Var. 3. Virgíneum.—Martius ap. Schultes fil. Tube shorter than the limb, lowest petal not divaricate. Brazil, on the road near Mandiocca. This plant is distinguished by a very variable feature in the shortness of the tube from the African plant, and having been found near the road-side, the same doubt may arise whether it was growing either in the site of an old garden, or where it had been thrown by accident, or whether it is really indigenous in the neighbouring country. It will be a circumstance rather singular, if this native of tropical Africa, distinguished by petiolation and a consequent disturbance of the veining of the leaves, and which seems less willing to breed with C. Capense than the Crinums of other quarters, should manifest itself naturally with these slight variations in Brazil also, and there only. I have one young seedling, which was raised after many failures from Capense by Spectabile, but it is not yet arrived at an age to flower. It is very singular that the Sierra Leone kinds should be unwilling to cross, while all the others seem ready to intermingle. The petiolated Crinum has usually six flowers, in weak specimens four, in stronger, if I recollect right, eight, perhaps more.

32. Scábrum.—Bot. Mag. 47. 2180.—Bulb large, leaves very long and glossy, of a lively green, with a scabrous edge; flowers striped with bright red and fragrant; very beautiful. In or by the side of upland woods near Rio Janeiro.

33. Submérsum.—Bot. Mag. 51. 2468. *Hybridum Spontaneum.* A single bulb was found by my collector in company with Erubescens (var.) Braziliense in a natural pond or spot still flooded after a long course of dry weather near Rio Janeiro. Certainly a spontaneous mule from that plant impregnated by scabrum. I have found it absolutely barren, with very dry pollen; its flowers are larger and brighter than represented from its first flowering before it was well established. After fourteen years' cultivation it has just yielded one offset. It differs very little from the mules raised from erubescens, var. 3. but is rather inferior to them, as having proceeded from a less conspicuous variety.

34. Concínnum. — Martius ap. Schultes fil. Scape green, 12-flowered; germen subsessile, tube scarcely curved, 15-17 lines long; limb 2-2½ inches long, segments 4-5 lines wide, sepals rather obovate, petals acute, filaments declined (except the upper), half as long as the limb; style nearly equal to the limb, stigma obtuse. Flowers in the dry specimen violet-purple. Fresh colour and leaves unknown. In the mountain fields of Minas Geraes, Brazil. It is much to be wished that this plant could be obtained from Brazil. This imperfect notice is the only one of any occidental Crinum with an umbel exceeding eight flowers.

35. Ornátum.—Bulbo sphærico, caudice gracili, foliis undulatis, umbellâ sub-viginti-florâ, perianthio laciniis latis extus striatis, loculis polyspermis. Bulb sphærical, column slender, leaves undulated, umbel 20-flowered or under, segments of the perianth wide, striped without; cells with many ovules. Asiatic.

Var. 1. Zeylánicum.—Am. Ornata. Bot. Mag. 29. 1171. Am. Latifolia. And. Bot. Rep. 478. Bulb and column very deep red; leaves very undulated, the young ones tipped with red, scape purple, 2½-3 feet high, flowers 12-20, deep purple, declining on the edges to white.

Var. 2. Herbertiánum.—Wallich. p. 39. t. 145. Bulb and column not red; leaves 1½-2 feet long, 4 inches wide, attenuatedly acuminate, much undulated, with a secondary undulation on the margin, dark green, very glaucous underneath (not so in the plate), scape purple on one side, flowers 12-16 fragrant, deep purple edged with white. Flowers in the rainy seasons in ditches near Rangoon in company with Zeylanicum.

Var. 3. Latifólium.—Bulbo et caudice uti in Zeylanico, minùs saturatè rubro; foliis undulatis margine undulatiore, ortu rubro non apiculatis, scapo viridi breviore, floribus Zeylanico pallidioribus. It may be distinguished from Zeylanicum by the secondary undulation of the margins of the leaves, and the absence of the red tip to the young leaves, as also by its green scape and paler flowers. The plant figured in the Bot. Reg. is not Latifolium. It is very scarce in the Calcutta gardens; Dr. Carey informed me a few years ago that he had but two bulbs of it, and although it ripened seed, they rarely vegetated with him, and when they did, from the number of species collected together in his garden, he was no longer sure of obtaining the true plant. Bulbs of Zeylanicum, and others not genuine, have been repeatedly sent to England from the Botanic Garden under the name of Latifolium. Dr. Roxburgh omits in his description to mention the style which is not prolonged as in the plant figured in the Bot. Reg., but he says the leaf tapers to a blunt point, which does not agree either with that plant or with his own Latifolium, which I have had in cultivation a great many years, and still preserve. The plant compared with it under the name Lineatum, by Dr. Roxburgh, as quoted there, is C. Zeylanicum. Native of Bengal; the true plant will, perhaps, not be found now in the gardens of Calcutta. Floruit. Spofforthiæ, A.D. 1828. Scapo 16½ unc. basi purpurasc. germ. oblongo subsess. ¾ unc. pallidè viridi-purpurasc. floribus 6, tubo pallido, 3-unc. curv. limbo 4-unc. unguiculatè acuminatissimo albo striis latis purpureis; stylo superne rubro, limbum non æquante, filamentis longiore, polline pallido.

Var. 4. Longístylum.—Bulbo minore, caudice breviore vix rubro, foliis humilioribus, minùs arcuatis, apice obtuso; perianthio albo, roseo-striato, tubo 3½, limbo 3¾ unc. undulatissimo; stylo rubro filamentis ¼, limbo 1½, unc. longiore. Native of Bengal; differs from Moluccanum in having the style longer, and the tube shorter than the limb, which is more undulated, and the leaves obtuse.

Subvar. acútior.—Latifolium. Bot. Reg. 15. 1297. This plant is a sub-variety of the bulb named by me longistylum in Sweet's Hort. Brit.; distinguished by little but the acute point of the leaf, whereas the plant which I have cultivated a great many years as longistylum has a blunter point than any of the cognate bulbs. The aspect of these two bulbs is quite different from that of Roxburgh's latifolium, which comes near to Zeylanicum in general appearance; these approach to Speciosum and Careyanum.

Var. 5. Speciósum.—Bot. Reg. 48. 2217. Leaves less undulated than those of Zeylanicum, and narrower; flowers 15-20, striped with pink, almost white in the cold season. Flowers freely. Native of Bengal.

Var. 6. Moluccánum.—Bot. Mag. 49. Tulipa Javanica Rumph. Amb. A smaller plant, leaves much undulated, scape 1½-2 feet high, green, 5-6 flowered. Increases so much by offsets that it rarely flowers in the stove, and scarcely at all with us, unless placed in a hotbed.

Var. 7. Careyánum.—Bot. Mag. 51. 2466. This beautiful plant was brought to light by Dr. Carey, late of Serampore, and I had the pleasure of naming it after one of the best, the most amiable, gifted, and indefatigable of men; whose virtues and talents adorned his country, and whose labours have promoted the glory of the Almighty. I never saw that excellent man, but fifteen years' correspondence had accustomed me to look upon him as a dearly valued friend. His life was devoted to the diffusion of the Gospel; horticulture, natural history, and botany, afforded the brief recreation he allowed himself from his daily toils. His favourite plants were the Amaryllidaceous family, and to him we are indebted for our knowledge of many of them. He was born in 1761, at Hackleton, in Leicestershire, and embarked for India in 1793. In 1800 he was settled at Serampore, and he closed the labours of his useful life in 1834, beloved by all who knew him, honoured by all whom his name has reached, having translated and superintended the publication of the gospel in forty oriental languages, which he had the perseverance to acquire for that purpose. Born in the humblest circumstances, often uncertain of his daily bread, at first a journeyman shoemaker, then a village schoolmaster, he had before his departure from England taught himself to read the Bible in Greek, Latin, Hebrew, French, Italian, and Dutch, and had become conspicuous by his eloquent preaching, and his ardent desire to bring about the mission to India which originated in his powerful mind. When he arrived there he found it necessary to offer his services by a hand-bill to make or repair shoes, and after he had risen to the head of a flourishing establishment, and occupied the chair of three professorships, he was not ashamed to nail up the original hand-bill against the wall of his study, but took pleasure in considering from what a humble grade he had been lifted up to a more useful and distinguished station by the grace of God and his own virtuous perseverance.

Var. 8. Insígne.—Am. insignis. Bot. Reg. 7. 579. A very fine plant, introduced to this country from Ceylon. It is of larger stature than any of this family, with more glossy and less undulated leaves than the rest. Dr. Carey had another kindred bulb, which he called C. ornatum, with pink-striped flowers, from Mauritius. He sent me a bulb of it, but it perished during the voyage. I have no particulars by which I can designate it.

(*Species dubia.* Lanceanum, *mihi Sweet. Hort. Brit. ex Surinam. Nondum floridum, et forsitan C. Broussonetiani ex Africâ ibi delati varietas. Formosum, Herb. Append. idem est cum Arenario blando var. falsò ex Braziliâ allatum fuisse dictum.*) C. Osbeckii Desfontaines Cat. Hort. Par. habitatione ignotâ non inter species recipiendum est: hybridum verisimiliter hortense ex meis; forsan Scabro-Capense? Rejiciendum est parili ratione Multiflorum Desf.

B. *Foliis non undulatis, umbellâ pedunculatâ.—Leaves not undulated; umbel pedunculated.*

1 *Perianthio patentiore; Australes.—Flowers more patent; Australian.*

36. Brevilímbum.—Bot. Mag. 47. 2121. p. 7. "Foliis rigidissimis attenuatè acutis; limbo lato brevi primulæ speciem præbente, albo; filamentis rubris. Planta magnitudine Crini erubescentis." Carey MS. This singular plant, with rigid and acutely attenuated leaves, short broad white limb, like that of a primula, and red filaments, was raised by Dr. Carey from seed received from Australia, probably from the same unknown quarter as Brachyandrum. This insufficient description does not satisfy me where to place it; the description of the flower comes nearest to that of Flaccidum, but the leaves would suit rather with Sumatranum and Macrocarpon. He did not state whether it was pedunculated or not, but called it about equal to Erubescens in size. It was unfortunately lost by him soon after its flowering.

37. Fláccidum.—Bot. Mag. 47. 2133. Am. Australasica Bot. Reg. 5. 426. This plant has seeds smoother than those of any other Crinum I have seen, and inclining to pearl colour, but I have crossed it with both Asiaticum and Australe. It succeeds in a cool part of the stove, and is also capable of living in the open ground, where I have had it some years in front of the stove, but it has not flowered there. In a greenhouse it should be left dry in winter.

2. *Flore minùs patente; loculis polyspermis. Africanæ meridionales.—Flower less patent; cells with many ovules. South Africa.*

38. Forbesiánum.—Trans. Hort. Soc. 6. p. 83. Tabula picta ap. Hort. Soc. Londini. Bulbo magno sphærico, foliis loratis canaliculatis glaucis ciliatis, umbellâ 30-40-florâ, floribus lætissimè purpureis.

Var. *(fortuíta)* punicea. Ib. floribus lætè purpureo-kermesinis magis revolutis.

This superb species, with from 30 to 40 purplish red flowers, was found by Forbes on the banks of the Delagoa river, on the south-east coast of Africa. The bulbs were very large, but of difficult culture, and I fear that they may have been all lost by rottenness. I believe the exposure of the bulbs to our damp atmosphere has been the cause of their perishing. I raised three seedlings from C. Careyanum impregnated by it, but they were also very delicate. I lost the one I reserved for myself, and I believe the others are dead also. It is greatly to be regretted that no cross should have been raised from C. Capense by this beautiful species, and if any person in this country still possesses it, I hope he will not miss an opportunity of attempting it.

39. Revolútum.—Am. revoluta. A. Bot. Reg. 8. 623. Bulbo ovato foliis angustis, lorato-linearibus, acutè attenuatis, humifusis, æstivis, autumno deperiuntibus, floribus roseo-striatis. In dubio est, an hujus varietas sit Am. revoluta. Bot. Mag. 915. absque foliis? This plant is quite distinct from Am. variabilis. Jacq. the revoluta β. Bot. Reg. 8. 615. A light loam suits it best. It is a very ticklish plant, requiring absolute drought, in a cool situation, during six winter months. The bulb must not be kept above ground, but the neck just emerging. It will flower in the summer in the greenhouse, and approaches nearer to the tropical Crinums than any other native of the Cape. It will bleed to death if forced in the winter, and rot if watered at that season. It is difficult to say what Mr. Hibbert's bulb was (Bot. Mag. 915. without leaves) which perished after flowering. It was probably a variety of this plant, but if meant for the identical plant it is very incorrect. The tube of this plant is variable, and not always shorter than the limb; in Mr. Burchell's

native specimens and drawing it is longer, and the dried inflorescence might be mistaken for Capense, but the bulb and leaf agree with Bauer's drawing of the plant of the Hort. Kew.

40. Variábile.—Am. Variabilis. Jacq. H. Sch. 4. 426. Am. revoluta, β. Bot. Reg. 8. 615. C. Crassifolium. Herb. Append. I have restored Jacquin's appropriate name, variabilis, which I ought to have adopted at first. Foliis lætè viridibus erecto-arcuatis crassis germine gracili, floribus ortu albis rubro pallidè extus notatis, dein saturatè rubris. Species frigoris patiens, bulbulis quàm maximè prolifera. This is the hardiest known species; out of doors it preserves its leaves in winter longer than Capense, and it shoots earlier in the spring. Both this plant and revolutum have a slender germen, but the idea conceived from Jacquin's plate by some persons of its cells being monospermous was erroneous. It leaves are deep green. The flowers turn to a rich purplish red, so that flowers of two colours are always on the same umbel, as represented by Jacquin. The figure in the Register was taken at too early a period for a just representation, before the expansion of the flowers. Mr. Ker considers Am. revoluta (Bot. Mag. 1178.) to be this plant. The plant offered at Mr. Woodford's sale, which Mr. Wykes, his gardener, asserted to be the one from which the figure was made, was not distinguishable from a common glaucous-leaved C. Capense; and I observe in Mr. Ker's description, he says of the leaves *rather glaucous*, which is not the case with any bulb I ever saw of variabile, which has the green very bright; and if the plant had been variabile, the two decaying flowers in the figure would have been intensely red. The figure, therefore, if intended for C. variabile, is quite incorrect; but it agrees better with some plants that I have of C. Capense. Mr. Ker draws a peremptory distinction, that in variabile the tube is shorter than the limb, and in Capense longer; but in his own figure of Capense (Am. longifolia Bot. Mag. 18. 661.) it is shorter. Usually, however, the tube is longer than

the limb in Capense, but it is a very variable plant, and in some seedling varieties its flowers change to red, as in variabile, which I consider to be much more akin to it than to revolutum. It is therefore best to discard all consideration of that plate, and of Mr. Ker's description accompanying it, as far as it disagrees with his amended description in the Bot. Reg. 8. 615. I grieve that he should ever have imagined on this subject, that I could have intended the least incivility to him, from whom, in whatever intercourse I had with him on botanical matters, I had met with the utmost urbanity. When I published that Mr. Griffin disclaimed all knowledge of Mr. Woodford's bulb, which the editor of the Bot. Reg. had stated to be in his collection, it never entered into my mind that I could be supposed to accuse him of wilful inaccuracy, and I was cautious not to deny the fact, but only Mr. Griffin's knowledge of it. On further explanation it appeared that the bulb never had been in Mr. Griffin's hands, nor seen by him; but Mr. Ker had misunderstood a memorandum written by Mr. Griffin, which was certainly so worded through inattention as to render the misconception almost unavoidable. I am glad to have this opportunity of stating, that although I have found some of Mr. Ker's views to be erroneous, (and where is the man whose views are free from error?) I place great reliance on the general accuracy of his botanical labours.

41. Capénse. Var. 1. princeps.—Am. Capensis. Miller G. dict. Am. longifolia. Bot. Mag. 8. 631. The name longifolium had been pre-occupied by an Asiatic species, before this plant was recognized as a Crinum. Miller's name, Capense, is therefore adopted.

Var. 2. Ripárium.—Bot. Mag. 53. 2688. Bot. Reg. 7. 546. A very fine dark purple variety with fewer ovules; introduced by Dr. Burchell from the banks of the Black River. Permanent by seed, if kept by itself; not with certainty if near the other varieties.

Var. 3. *(fortuita)* flore albo. A very handsome white variety, introduced from the Dutch gardens, probably raised in Holland. Not permanent by seed, if near other varieties; but nearly so if kept apart while in flower.

The seedlings of this species, which is easily recognized by its long glaucous leaves, vary so much in the length of the peduncle, tube, and limb, and in the shade of colour, which is usually a mixture of dull red and white, that it is not advisable to designate any further accidental varieties. It is a very hardy species, endures the winter, and flowers in profuse succession during five or six months in a bed covered with leaves in the winter, and with me it ripens seed by the bushel. It delights in wet, and will flower in a pond, but its fibres are rather disposed to rot in the water of a cold pond in the winter. In a warmer situation it may remain always in water. I do not know that its fibres would rot if it was growing in the soil under the pond. It might be advantageously planted by the edge of any ornamental piece of water, and would form a beautiful clothing for a small island, where it would afford thick covert for waterfowl. Nursery gardeners might easily rear it from seed to sell by the hundred. A covering of leaves is not necessary to it, and its own dead foliage would give it a good deal of protection. I have had the neck of a bulb, which was left in a pot standing in a small pond, clasped tight by ice two inches thick for a fortnight, without receiving any injury from it.

42. Campanulátum.—Bot. Mag. 47. 2121. p. 7. Aquaticum. Bot. Mag. 49. 2352. Specim. Herb. Burchell. A most remarkable plant; very like variabile in foliage, but its leaves are less vigorous, more fleshy and tortuous. Flowers rosy red, with a green waxy membrane at the mouth of the tube, which appears in no other species, and is so foreign to the genus, that I was at first almost tempted to believe it was generically distinct, and to detach it under the name Crinopsis; but, although its fruit is unknown, I expect that it will be found to conform with the other species. Dr. Burchell imagined that the spot on which he found it was always under water. He must, however, have been de-

ceived in that respect, for it is very prone to rot, if incautiously watered. I lost three plants in consequence of having placed them out of doors in front of a stove, where they cannot endure the cold dampness of the winter. I lost another last year by leaving it out in the rain in September, and the finest bulb of the kind at Highclere was killed by one profuse watering in a low temperature in October. It is a plant of difficult culture on this account, and though it may bear much wet in the hot season, it is certainly not an aquatic plant. I have therefore restored the name which was first published; as the second, which was substituted in compliment to Dr. Burchell's MS. label, is fallacious, and may lead to its loss in cultivation.

43. Longiflórum. *Hybridum vix spontaneum;* ex erubescente et Capensi. Am. longifolia γ. Bot. Reg. 4. 303. loculis 9-11-spermis. ex Jamaicâ. Varietas alia est ex Demerarâ, ubi C. Capense in scrobibus viget.—*Hybridum hortense,* Erubescente-Capense Bot. Mag. 49. 2336. vix diversum est, loculis 14-spermis. The plant figured in the Bot. Register is a mule between erubescens and Capense from Jamaica; another mule differing a little was brought from Demerara, where C. Capense, originally planted in gardens, is naturalized in the ditches: and they are not materially different from the artificial mules raised from the same intermixture in this country. The little difference that exists arises perhaps from their having proceeded from different varieties of erubescens.

44. Paxtóni. –*Hybridum fortuítum;* ex Indiâ orientali. Bulbo 20 unc. circu. caudice 8 unc. foliis scabro-erubescentis foliis affinibus nitentioribus, scapo bipedali purpurascente, umbellâ 20-30-florâ inclinatâ; germine sessili, tubo viridi purpurascente 5 unciali, limbo 3½ pallidissimè erubescente saturatè roseo-striato, expansione 6 unciali, stylo puniceo filamentis parum longiore, limbo ½ unc. breviore, antheris tortilibus corrugatis, polline subsicco, loculis ovulis 7-8 indistinctis. The flowers of this fine plant, which was sent by Lord William Bentinck, from the East Indies to the Duke of Devon-

shire, come very near to those of Scabro-Capense, having the tube rather longer and the expansion greater, the colour nearly similar; but they are much more numerous. I take it to be cross between Scabrum and some other species in the Calcutta garden. The leaves are very like those of Scabro-erubescens, but more glossy. Its dry pollen and shrivelled anthers shew that it is not a genuine species. I have named it after the Duke of Devonshire's very skilful and intelligent gardener at Chatsworth.

Species dubiæ.—Doubtful species.

45. Algoénse.—Mihi ap. Sweet Hort. Brit. Nondum floridum ex Africâ meridionali, prope *Algoa bay*, foliis C. revoluto affine, angustioribus, magis canaliculatis. Forsan revoluti varietas.

46? Album.—Am. alba, foliis lineari-lanceolatis, flore albo, spathâ 10-flora, floribus declinatis. Kurmæ. Arab. Soraf.—Forskæl. Fl. Æg. Ar. 209. I can scarcely doubt that this plant, with ten white flowers, must be a Crinum, and from its abode in Arabia, it is probably distinct from all that have been described.

Caffrum.—Mihi ap. Sweet Hort. Brit. nondum floridum C. campanulato simile et vix diversum est.—Caffrum et Formosum Herb. App. delenda sunt. Formosum est Arenarium v. blandum.

Hybrid or mixed crosses.—1. *Gowéni*, or Zeylánico-Capense. Hort. Soc. Trans. ic. vol. 3. p. 187. First raised from Capense impregnated by Zeylanicum by J. R. Gowen, Esq. at Highclere. I received, a few years ago, a bulb of the same cross accidentally produced from seed of Capense in in Dr. Carey's garden in the East Indies.—2. *Mitchámiæ*, or Australi-Capense. First raised by me from pollen of pedunculatum at Mitcham in Surrey; a sub-variety very different from pollen of Canaliculatum, and another from pollen of Exaltatum, afterwards at Spofforth. These crosses are fertile, and ripen some seed every year out of doors in front of the stove. Some of the seedlings are like the cross-bred parents, some, having been produced by the pollen from a large bed of Capense close by, revert very near to the type of Capense. When there are no plants of Capense in flower they come true to the mule type. The cross from pedunculatum is of very large stature, and follows the habit of the male parent in the splitting of its huge columnar bulb, but produces offsets. They produce a succession of scapes till winter, and are very handsome. They are perfectly hardy; but the climate of Yorkshire is seldom hot enough to make them flower in the middle of the garden.

3. *Herberti*, or Scabro-Capense; named by Sweet Hort. Brit. A plant of great beauty, bearing 11 flowers on a scape 3 feet high, peduncles short, with the germen little more than an inch, tube 4 inches, limb 3½, blush with deep red stripes, expansion about 5 inches; style as in scabrum, longer than the limb, red towards the end; filaments, anthers, and pollen white; stigma crimson, small; ovules perfect, 22-24 in a cell; leaves 5-6-feet long, above 4 inches wide. It requires a warmer situation where the wall is a little heated to make it flower finely, which it does several times each year in such a situation. This cross had continued barren 14 or 15 years, till the summer of 1834, when it produced, in the border out of doors, one smallish seed, which vegetated; but the leaves of the young plant were colourless and it died in a few months. In 1835 one larger seed was produced which was sown in white sand and grew freely. It is now above a year old, shewing no signs of approximation to Capense, the leaves being of a bright green, with no glaucous tinge, and the plant must be either the genuine offspring of the mule, or the seed may have been fertilized by Pedunculato-Capense which grew close beside it.

4. *Puseyæ*, or Specioso-Capense; named after my niece Lady Emily Pusey. 5. *Wallichii*, or Careyano-Capense; named after Dr. Wallich. 6. *Seymouri*, or Revolúto-Capense. 7. *Roxburghi*, or Defixo-Capense. This cross has produced seed. 8. *Eboráci*, or Asiatico-Capense. 9. *Altaclárœ*, or Erubescente-Capense; Bot. Mag. 49. 2336. This cross, raised at Highclere and at Spofforth, from two different varieties, does not flower freely, producing a superabundance of offsets, on which it wastes its vigour. The converse Capensi-erubescens is a handsomer variety. 10. *Shepherdi*, or Cruento-Capense; named after the late conductor of the Liverpool garden. It has been standing a great many years in the border in front of a stove beside Scabro-Capense, but has never flowered, probably requiring more heat. 11. *Bacóni*, or Zeylanico-erubescens. Raised in the stove of the

late A. Bacon, Esq. 12. *Stapletóniæ*, or Zeylánico-pedunculatum. Raised in the stove of the late Earl of Carnarvon, and named after his daughter Lady Harriet Stapleton. This plant strongly supports the opinion I had long entertained concerning the origin of C. amabile, having altogether the semblance of an inferior variety of that plant. 13. *Louisæ*, or Specioso-defixum; named after my eldest daughter. An exceedingly pretty and remarkable plant, of which I raised but one bulb many years ago, which has not yielded any increase by offsets, and is sterile. The leaves are long, loriform, and flaccid, unlike the habit of its female parent, and the flowers are striped with purplish pink. 14. *Brownii*, or Americáno-bracteatum; named after Dr. R. Brown. A very ornamental cross. 15. *Letítiæ*, or Erubescente-bracteatum; named after my wife. A remarkable plant, of larger growth than either parent, with a red column, and an umbel of about 10 large white flowers. It flowers very frequently, and is very ornamental, increasing by offsets. 16. *Digweedi*, or Scabro-Americanum; named by Sweet after Digweed, who raised it in the stove at Highclere. It does not flower freely; in foliage it resembles scabrum very much. 17. *Cecíliæ*, or Exaltato-scabrum; named after my younger daughter. One plant thereof was raised at Spofforth many years ago, with a tall red column, the leaves more flaccid than Amabile. The flowers are striped with red. It has yielded no increase. 18. *Coopéri*, or Specioso-longifolium; raised by Cooper at Wentworth. 19. *Parkéri*, or Americano-erubescens; raised at Spofforth. 20. *Murrayi*, or Forbesiano-Careyanum; raised at Spofforth; named after the conductor of the Glasgow garden. 21. *Decandólii*, or Fláccido-canaliculatum; named after Mons. Decandolle; a very remarkable cross with pendulous flaccid leaves. They have not yet flowered. 22. *Haylocki*, or Flaccido-bracteatum. One plant of this curious cross was raised many years ago at Spofforth and has grown very slowly. It has not yet flowered, but may be expected to do so soon. It has an oval bulb with a long slender column arising from it, and very long pendulous flaccid leaves. 23? *Clarónis*, or Spectabili-Capense. One seedling which has not flowered, raised at Spofforth, and named from the Hundred of Claro, but the cross, from its aspect, is doubtful.

It will be observed, that with the exception of the imperfect notice derived from Dr. Martius of his C. concinnum with 12 flowers, and the nine-flowered inflorescence of purpurascens from a West African island, no occidental or West African Crinum has been found with more than 8 flowers, and we may probably assign 12 as the maximum. The many-flowered species belong to East Africa, Asia, and Australia.

Sjovanni pola tali (Rheede H. Mal. p. 77.) agrees with no known species. I suspect that it is a most inaccurate representation of Amœnum, but the figure is more like the African spectabile.

The pedunculated species in this genus are for the most part disposed only to incline the bud, the sessile and subsessile to nod.

67. **Amarýllis.**—Leaves hiemal, arcuate; scape autumnal, before the leaves; umbel many-flowered, pedunculated, divaricate; germen triangularly obovate; tube narrow funnel-shaped; petaline filaments adhering to the petals, sepaline to the mouth of the tube; anthers incumbent, attached in the middle; capsule obovate, disposed to burst prematurely.

1. Belladónna.—Bot. Mag. 9. 733. The type of the Linnæan genus Amaryllis. Hort. Cliff. See article Hippeastrum.

Var. 2. Pállida.—Red. Lil. 479. Bot. Reg. 9. 714.

Var. 3. Latifólia.—Foliis latioribus. Leaves very broad.

These bulbs are natives of the Cape of Good Hope, and are naturalized in Madeira, having been probably disseminated from gardens. They are exceedingly hardy, but two things are necessary to their flowering, a strong growth of the leaves, and absolute rest from Midsummer till their period of flowering in September. If the leaves sprout early, and are so much damaged by severe frosts that a vigorous growth does not ensue in spring, or if they are prevented by drought in the spring from developing themselves, or are preserved green by a wet summer after the period of rest, or if they have not moisture in September to promote the blossoming, it will fail, and in the latter case the abortive flower-buds will be thrown out of the ground when the leaves sprout afterwards. I have tried cutting the leaves off in a wet summer, but that did not give the rest from moisture and the heat during the period of rest, which is requisite to the formation of the flowers, nor did it allow the return of sap to the bulb at the moment of desiccation. It is quite clear that Mr. Knight was in error in imagining that the flower of such bulbs is formed during the growth of the leaves; though a strong previous growth of the leaf seems necessary to its formation by the return of the sap from the leaf at the time of their decay; the seasonable drying up of the leaf seems to be the requisite circumstance, if followed by a sufficiently high temperature. In a pot it is very easy to regulate the points above stated; in the open ground it can only be done by putting a glass covering or awning over the bulbs, so as to keep off the rain in a wet summer. At Spofforth the bulbs of A. belladonna are placed at two feet distance from the front wall of a stove and greenhouse; and there, in a favourable season, near 200 stems rise in September in thick patches. I have seen 30 stems in close contact. A rich and even strong and manured soil is agreeable to them, and a south wall promotes the drying of the roots in summer. They very rarely flower with me in the middle of the garden. The proper treatment of all greenhouse bulbs that flower before the appearance of the leaf in autumn, is to promote a vigorous growth of leaf in as airy a situation as may be found suitable to their respective constitutions, to keep them hot and dry while at rest (a glass frame in the full sun will answer the purpose), and to water them freely when the time for vegetation arrives. The flower-bud is probably formed at the moment when the leaf perishes, but without sufficient heat during the time of apparent rest, the bulb will not supply it with the juices necessary to bring it to perfection, which in many cases enable it to sprout without any aliment to the bulb. I possess a plant belonging to the confused mass of Ornithogalum, which produces a strong spike of flowers a yard high, and ripens its seed if kept without water; but a single copious watering is fatal to the scape and brings forward the leaves, which should not appear till later. The seeds of Belladonna are pearl colored, purple on the exposed side, and the seedlings are many years coming to maturity. The plant long cultivated in Europe is beautifully pencilled with red; the variety brought of later years from the Cape is paler, and turns to a deeper red as it fades; the leaves of the broad variety shew more diversity than the flower. Some imported bulbs have a much taller and more robust scape, and their flowers in fading assume a deeper red.

With respect to the doubts expressed by Mr. Ker, Bot. Mag. 733. & 1450. concerning this and the following plant, I have to state that the pale-coloured variety, imported from the Cape, has seeds precisely similar to those of the old variety; that I have received both, and other shades of variation from the Cape; that the notion of a pale vernal Belladonna, originating with Miller, is quite erroneous, and that, whenever a vernal scape has been produced, it has been the delayed autumnal scape, which is usually thrown up abortive in the spring, preserved by some accident of the season through the winter; that the pale-flowered variety of Belladonna, which has been often confounded with blanda, B. M. 1450, is quite distinct from it; that the bulb imported by the Hort. Soc. from Madeira, and supposed at first by Mr. Sabine to be vernal, flowers with me in the autumn, and has no peculiarity. The bulbs of Sir J. Banks and Van Royen were the pale belladonna, and not blanda. The leaves of blanda are much more erect, strongly ribbed and nerved, and vaginate more; its constitution is much tenderer. Mr. Sweet was wrong in altering the Linnæan name of this genus, and shewed complete ignorance of its affinities in placing it at a distance from Brunsvigia, between Habranthus and Hippeastrum.

2. Blánda.—Bot. Mag. 35. 1450. This beautiful plant was found by Niven, who collected for Mr. Hibbert, and I believe has never since been met with by any collector. I purchased one of the bulbs when Mr. Hibbert disposed of his collection, and Mr. Griffin had another. Mr. Knight, of the King's Road, Chelsea, who had the rest, killed them by planting them in the open ground, which they will not endure in this country, and I believe there are no bulbs of it in Europe but the produce of those two. I lost two by planting them in front of the stove; one died the first winter, the other only lingered till the second. The leaves of this and the following species, when cut by frost or drought at the points, will not continue to grow like those of Belladonna. It requires an airy situation in the greenhouse in winter, drought and dry heat in summer, and will then flower magnificently in September. Whatever may have been the growth of its leaves, it will not flower if it is left in a cold situation while dry.

3. Josephiniána.—Josephinæ. Redouté Lil. 3. 370. 372.

Var. 2. Flore vix striato. Bruns. Josephinæ. Bot. Mag. 52. 2578.

Var. 3. Griffiniána. — Bruns. Josephinæ minor. Bot. Reg. 192. 193.

It will be remembered that in my Appendix I stated the great affinity of this plant to Amaryllis blanda, and the difficulty I found in dealing with the genus Brunsvigia. At that time I did not possess this species, excepting a small seedling from the Malmaison bulb, which, though above twenty years old, is not yet bigger than a fowl's egg. I have since obtained four seedlings from Josephini., impregnated by A. blanda, and failed at the same time to obtain any by impregnating it by B. multiflora. This is decisive as to Josephiniana being an Amaryllis, and leaves a probability that the Brunsvigia of Heister may yet be upheld. Blanda has a strong midrib to the leaves, which sheath above ground; Josephini. no midrib or sheathing: the seedlings sheath and have a midrib, though much less conspicuous than that of blanda. They are now ten or eleven years old, and have reached a larger size than a natural Josephiniana raised from the same scape, and they shew some diversity of foliage amongst themselves. I believe that the very large imported bulbs of this plant and B. multiflora may be 100 years old. As they sprout but once a year, nothing can be done to accelerate their growth, beyond keeping them in a healthy and vigorous state: for which purpose the bulb must be kept under ground, with the neck perhaps above ground; but of that I entertain great doubts. If the whole bulb is exposed, it imbibes moisture from the atmosphere in the season of rest, which becomes fatal to it, and I have found the seedlings of which the neck has never been raised above ground in the safest state. A rich light loam and abundance of water in winter, perfect rest and dry heat in summer, are necessary. There is a good deal of variety in the foliage of imported bulbs, some having it more obtuse and undulated than others. The lesser variety, which I have named Griffiniana, because minor is applied to a kindred Brunsvigia, is a distinct local plant of very inferior stature, and I have never seen any intermediate variations.

4. Grandiflóra.—Bruns. Grandiflora. Bot. Reg. 16. 1335. This fine plant evidently belongs, as well

as Josephiniana, to the genus Amaryllis, and I expect that my cross between the two last species will much resemble it. I lost my bulb of grandiflora very soon, and I fear that all that were imported at the same time may have been also lost in consequence of the dangerous practice of keeping the bulb above ground.

Var. 2. Banksiána.—Pl. 32. fig. 2. Spec. Herb. Banks. ex hort. Kew. Leaf not half an inch wide (7-16ths); peduncle near 6 inches, curved at the end; perianth $2\frac{5}{8}$ long, segments about $\frac{3}{8}$ wide, about half an inch longer than the filaments and style; tube scarcely any. There is a single flower of this plant with a portion of a leaf from the Kew Garden, in the Banksian herbarium. It was probably one of Masson's plants, and seems distinct from any known species, unless it be grandiflora, to which it is clearly allied; but if the true leaf is attached to it (which may always be doubted with respect to plants that produce the leaf and the flower at different seasons), it is not above one-third the width, if so much, Never having seen the capsule of grandiflora, nor its flower so as to ascertain the point of adhesion of its filaments, I judge by its affinity in bulb and foliage to Josephiniana, and by the germen of which I have given a representation, that it is an Amaryllis.

Amaryllis pudíca, *Ker.* is certainly an abortive specimen of A. Belladonna, of which all the buds had perished except one; a circumstance not unusual with bulbs that flower on their first importation, before they have made fibres. When the leaves grew, it became of course confounded with other plants of A. Belladonna, and therefore could not be identified afterwards. In consequence of Mr. Ker's statement that a specimen existed in the Banks. herb. conformable to A. pudica, except in having a sessile instead of a pedunculated germen, a distinction however which would have been insurmountable, I have most carefully examined that herbarium, and the result of the inquiry is, that the statement is erroneous. There are one-flowered specimens of Crinum Distichum, and one of Crinum yuccæides (Broussoneti.) from Kew Gardens, and marked Sierra Leone. It is scarcely possible that such plants should have been confounded with the supposed A. pudica. There is a single flower with its very long peduncle cut off from the umbel of a magnificent Amaryllis grandiflora, var. Banksiana, above described, and beside it the fragment of a leaf. Is it possible that, in a hasty consideration of the specimen, the absence of spathe should have been overlooked, and the peduncle regarded as the scape of a one-flowered plant? Persons of the greatest general accuracy are liable to such oversights. There has certainly been an error of some kind, because the herbarium furnishes nothing else that can be compared with the supposed A. pudica, unless it be the one-flowered specimen of Oporanthus luteus, which is labelled A. pumilio; but Mr. Ker refers to that as pumilio, and it entirely disagrees with the description of A. pudica, in not having the lower segment pushed down by the superincumbent stamens. Concerning that specimen see Gastronema. The species is stated to rest on the authority of the late Mr. Salisbury, but I have too often ascertained Mr. Salisbury's excessive inaccuracy concerning facts of this kind, to have the least dependance upon it. The species should be finally erased as founded on a mistake.

Amaryllis alba. Kurmæ. Arab. Soraf. Forskæl. Flor. Æg. Arab. 209. is probably a Crinum.

68. **Brunsvígia.**—Leaves broad, recumbent, hiemal; scape autumnal, precocious; spathe broad; germen angular; tube very short (little more than annular); perianth, style, and filaments, recurved; filaments adnate to the annular tube only; capsule triangularly turbinate.

1. Multiflóra. — Heister Mon. Bot. Mag. 39. 1619; scapo viridi.

Var. 2. Rubricaúlis. Jacq. H. Sch. 1. 39; scapo rubro.

The statement in the Bot. Mag. that this plant has black shelly seeds is quite erroneous. All Brunsvigias have green seeds, perhaps sometimes coloured on the side exposed to the sun. I have bulbs of rubricaulis raised from imported seed, now fifteen years old and thriving, but yet no bigger than a plover's egg. Imported bulbs have white sand amongst their coats; and probably they grow in the sand, which preserves their delicate bulbs from rotting, and the vigorous fibres may perhaps penetrate into some stronger subsoil. They are very thirsty while in leaf, and it does not answer to pot them in sand. The same treatment that is recommended for A. Josephiniana will suit these plants. I do not know whether the green and red stemmed varieties are permanent by seed, but I find variation of leaf amongst the seedlings.

2. Striáta.—Jac. H. Schœn. 1. 70. A smaller plant than multiflora, with the nerves of the leaves stronger.

Var. rosea; floribus roseis. Spec. Herb. Bank. Spec. Herb. Lamb. falso B. marginatæ specimen esse putatum.

3. Radulósa.—Pl. 22. fig. 2. absque flore, adhuc ignoto. Burchell Cat. 2703*. Spec. Burch. Herb. (unà cum bulbis Angliam allatis) foliis margine (albo?) cartilagineo, obtusè ovalibus, 8 uncialibus, 3¼ latis, superficie asperrimè et minutè radulosâ. Found by Dr. Burchell in the country of the Bushmen near the Gariep, putting out its leaves earlier than B. multiflora, but the inflorescence is unknown. Of three or four bulbs which he brought to Europe, one was given by him to Prince Leopold, and may perhaps be still preserved at Claremont; the others perished at Fulham.

4. Minor.—Bot. Reg. 11. 954.

Var. 2. floribus roseis. Pl. 32. fig. 1. Burchell herb. 4044. Langekloof. Bulb small and oval, leaves an inch wide, in form like those of Radula, but smooth or nearly so on the surface. Dr. Burchell found also the first variety, with flowers whitish within, mixed with the rose-coloured.

5. Rádula.—Jacq. Hort. Schœn. 1. 68. This plant, with a very small bulb, and rasp-like leaves, is only known by the figure and description in Jacquin's work. It was probably one of Masson's bulbs from the western coast of the Cape territory. Its flower approximates to that of Nerine a little, but I do not doubt its being a true Brunsvigia.

6? Albiflóra.—Ecklon topog. Verz. p. 7. is unknown to me, and I cannot judge what it may be.

I believe all Brunsvigias have a cartilagineous margin and broad recumbent leaves; but if Brunsvigia is, as I believe it to be, distinct from Amaryllis, the distinguishing features are the triangular capsule, which is almost winged and diaphanous, and the petaline filaments not adhering to the petals. The genus was founded by Heister on multiflora, without any statement of the points by which it was to be separated from Amaryllis, but merely a description of that specific plant; it was adopted by others who distinguished it, not from the Linnæan Amaryllis, but from the mass of discordant plants accumulated under that name, or rather from an imperfect view of some of them; so that the character given became unavoidably more objectionable than the silence of Heister. I mentioned in the Appendix fifteen years ago that Josephiniana disagreed with multiflora in the insertion of its filaments, and in that point, as well as its tube and germen, I saw that it agreed nearly with blanda, but I was deterred by the curvature of its corolla from removing it from the genus where it had been placed. The fact, that Blanda has bred with it, is decisive that the other points mentioned furnish the true generic features, and the diversity of perianth is such as occurs also in Nerine. Joseph. not having bred with Multiflora at the same time, goes some way to uphold the diversity of the genus Brunsvigia: but my information is not sufficient to pronounce decidedly on its validity, though I believe in it. I know the capsule of Multiflora, Striata, and minor, which all disagree with Amaryllis. I do not know the fruit of A. Grandiflora, B. radulosa and radula, nor have I had any opportunity of ascertaining the insertion of their filaments, or those of Striata with exactness. There is, however, no fact ascertained which can throw a doubt on the genus Brunsvigia, except a general similarity of aspect in the umbels of Josephiniana and Multiflora, which awakens my suspicions, and I wish all those who have flowering Brunsvigias would try whether they can obtain a cross between them and Belladonna. In bulbs of this order I have often observed an imperfect bulb-coat acting like an internal bracte to enclose the incipient inflorescence. In Crinum Cruentum it is prolonged into a narrow lorate leaf, which indicates long beforehand the formation of blossom in the bulb. In Am. Josephiniana there are many half-bulb-coats, opposite and alternate.

69. **Nérine.**—Tube none, except an annular connexion; limb reflex; filaments with a gibbous monadelphous base; stigma ultimately trifid.

Sectio 1. Regulares.—Perianth regular.

Germine rectiore, revoluto-patente; filamentis et stylo fasciculatis, rectioribus. Germen straighter, revolutely patent; filaments and style fasciculate, straighter.

Centrípetæ.

With centripetal inflorescence.

1. Margináta. Jacq. Hort. Schœn. 1. t. 65. Am. marginata.
2. Curvifólia. Bot. Mag. 725.
3. Corúsca. Bot. Mag. 1089.

Centrífugæ.

With centrifugal inflorescence.

4. Venústa. Bot Mag. 1090.
Var. 2. Sarniénsis. Bot. Mag. 294.
Var. 3. Rósea. Bot. Mag. 2124.
Var. 4. Minor.

Sectio 2. Distortæ —Perianth distorted.

Germine deflexo; perianthio filamentis et stylo sursum curvatis. —Germen deflex; perianth, filaments, and style, curved upwards.

Centrípetæ.

5. Flexuósa. Bot. Reg. 172.
6. Pulchélla. Bot. Mag 2407.
7. Lúcida. pl. 26. f. 3. Bot. Mag. 2124. p. 2. A. latícoma. B.M. 497.

Centrífugæ.

8. Húmilis. Bot. Mag. 726.
9. Unduláta. Bot. Mag. 369.

Hybridæ.—Hybrid crosses.

Centrípetæ.

1. Mitchámiæ, or Curvifoliâ-undulata. Pl. 43.—Versícolor. Herb. Appendix. Sterile.
2. Haylocki, or Curvifoliâ-pulchella. Fertile.
3. Pulchellâ-undulata.

Centrífugæ.

4. Spoffórthiæ, or Venustâ-undulata.

Inflorescence not yet ascertained.

5. Pulchellâ-humilis. 6. Humili-undulata. 7. Curvifoliâ-venusta.

The genus Nerine, though defined by a feature that cannot be mistaken, the gibbous union of the filaments at the point of their junction with the base of the segments of the perianth which has no tube, except the annular junction of the segments occupying about an eighth of an inch, contains more extraordinary variations than any genus of the same order. The first section consists of those whose germen is continued nearly straight from the peduncle, the perianth regular, expanded and revolute, and the filaments fasciculate. In the 2nd section the germen is sloped from the peduncle, the perianth distorted and curved upwards, and the filaments at first curved downwards and afterwards rising and curved upwards. Such a difference might have led to the supposition that the two sections were generically distinct, but experience has shewn that they breed together freely. But there is yet a more singular circumstance attending this genus. In all the other genera allied to it (indeed, as far as I have observed, in this whole suborder) the inflorescence is centripetal (that is, the outer buds of the umbel expand first and the central last), unless perhaps the very crowded umbel of Buphane ciliaris is divided into compartments, by which the law is modified. In the genus Nerine, however, some species have a centrifugal and some a centripetal inflorescence, and this remarkable peculiarity does not coincide with the two sections, but divides each of them almost equally. The hybrid Nerine Mitchamiæ, which was figured in my Appendix under the name Versicolor, was produced by a centrifugal species, Undulata, fertilized by a centripetal species of the other section, Curvifolia, therefore doubly removed from each other. Its inflorescence follows the centripetal habit of the male parent. It is a shy flowerer, and seems quite sterile. Some raised three years ago from Pulchella by Curviflora, which, though in different sections, have the same course of inflorescence, show the type of the male much more strongly in the foliage, and grow more freely. The flowers are very similar to those of Mitchamiæ, or Curvifoliâ-undulata, having the same pale rose-colour, changing to a greyish purple, but they are produced in a more vigorous state, appearing to be quite fertile, and I expect to obtain seed both from the mule, and from Curvifolia fertilized by it. I attribute the difference in the apparent fertility to the parents having the same habit of inflorescence, both being centripetal. I was formerly of opinion that the Am. marginata of Jacquin must form a genus by itself, intermediate between Brunsvigia and Nerine, having been misled to that decision by a specimen professing to be that plant in Mr. Lambert's herbarium; but I have since observed that the specimen was not in any manner ascertained to be Marginata, but was named conjecturally with a quære, and on comparison with Masson's specimen of Brunsvigia Striata in the Banksian herbarium which has the leaf with it, and is certainly correct, I am satisfied the specimen supposed to be Marginata is in truth B. striata. We have therefore no knowledge of Marginata excepting from the figure and description by Jacquin. In his plate it differs from all other species of Nerine in having broader leaves, with a red margin and a short blunt spathe, in which respects it approximates more to Brunsvigia. The inflorescence differs in no other respect from that of Curvifolia, except being less undulated, and I have lately observed the undulation of Curvifolia very much diminished under some circumstances of temperature, and in particular seedlings. Jacquin mentions that marginata has a fetid smell, and, having in the autumn of 1835, placed Curvifolia one sunny day in the stove to observe the effect of heat on the posture of its filaments, I was surprised to find that it had a fetid smell, something like that which the most fragrant hyacinths acquire when they are beginning to decay. That circumstance is decisive as to the near affinity of the two plants, and (the confusion occasioned by the supposed specimen in Mr. Lambert's herbarium being removed) I have no hesitation in saying that it is a Nerine, with broader leaves than any of the other species, and differing further in having a red margin. I have, however, plants of Curvifolia with the leaf nearly as broad. This remarkable plant must have been one of Masson's collection; he followed the Western coast from the Cape, and no other traveller has pursued the same track, which is the cause that several of the plants which he introduced have not been since met with. Marginata agrees with Curvifolia in having the new leaves sprouting during the time of flowering; those of Brunsvigia appear after. Curvifolia flowers freely; Corusca spawns too abundantly; Venusta minor is a beautiful miniature of Venusta, and flowers pretty freely. I have had it about twenty-five years, but it has never been figured: the colour deep red. Flexuosa, pulchella, humilis, and undulata are of easy cultivation. Undulata flowers strongest out of doors against the front wall of a greenhouse. The flowering of all is autumnal, in some pushing a little before the leaves, in some as Flexuosa and Undulata after. My first mention of Lucida, in the Bot. Mag. represented it to be a Nerine. I was afterwards misled by an insufficient examination of a dry specimen to think it an anomalous Brunsvigia. My first impression was right, and I have since ascertained that the inflorescence and fruit exactly agree in all points with Nerine. The only peculiarity it has is, that after a period of rest its old leaves are more disposed to push again, but I find other species of Nerine capable of elongating their leaves after the ends have been injured, which a Brunsvigia cannot do.

To promote the flowering of Nerines a vigorous growth of leaf must be encouraged in the autumn; the requisites are warmth enough to excite them, and air enough to prevent their growing weak. During the winter they must not be allowed to lose their foliage either by frost or drought. About May they should be allowed to rest by ceasing to water them. After three months' rest they may be watered again to promote their growth, at the very beginning of September. Lucida, which grows near the snowy mountains in Africa, and is probably there cut by frost in the winter, seems more disposed to grow whenever it can, pushing out afresh the leaves of which the tips have been damaged, whether by drought or frost. I believe its native situation is refreshed in the hot season by frequent thunder-storms, so that it has not the decided term of rest, which the dry season forces upon its congeners in the lower country. I find its leaves very willing to grow in winter with a little assistance of artificial heat. The other species suffer more from any injury to the point of their growing leaves. Dr. Burchell found N. lucida growing in company with Uncaria procumbens between Gattikamma or Wittewater and (Aakaap) Riet fonteen, and coming into flower on February 15. The seed was ripe ten days after. Its flowering in its native place is therefore autumnal. At that time Buphane toxicaria was in leaf, and its flowers long passed. Gattikamma is 22 miles from Kloarwater, which is in Lat. 28°. 50′. 56″. s. Long. 24°. 3′. E.

Hybrida. 1.—Michamiæ, curvifoliâ-undulata, tab. 43.—Bulbo viridi-purpurascente; foliis ¾ unciæ latis, sub-glaucis, obtusè acuminatis; scapo viridi, 18-unciali, 3/16 lato, basi aliquando purpurascente; umbellâ circiter 16-florâ, bracteatâ; pedunculis uncialibus; germine loculis circiter 6-spermis, ovulis plerumque emarcidis; corollæ laciniis semipatentibus undulatissimis apice reflexo, 1¼ uncialibus, ¼ unciæ latis, roseo-rubentibus, dein cœruleo-purpurascentibus costâ mediâ vel striâ rubente; stylo et filamentis roseo-rubris inferne purpurascentibus, stylo filamentis longiore, corollâ breviore, denuò assurgenter curvato; stigmate albo.

About four and twenty seedling bulbs of this mule were raised in 1815, at Spofforth, from Nerine Undulata, impregnated by Curvifolia. No difference has been observed amongst the seedlings, excepting that some have the leaves a little more glaucous than others, and some have the scape green and others a little purpurascent. The bulbs are of a greenish purple, the leaves rather glaucous, $\frac{3}{4}$ of an inch wide; the scape a foot and a half high, 3-16ths of an inch wide; peduncles about an inch long, flowers about 16; the laciniæ of the corolla $\frac{1}{4}$ of an inch wide, $1\frac{1}{4}$ long, very undulate, half expanded, with the tips bent back, rose coloured, changing after a few days to blueish purple, except the middle rib or stripe, which continues red. The cells, which in Undulata are 2-seeded, and in Curvifolia about 8-seeded, in the mule are generally 6-seeded, but the ovules are discoloured and probably imperfect. In Undulata the germen is always bent downwards by the premature growth of the seeds in the upper cell, by which the corolla and filaments become distorted; in the mule the germen continues straight as in Curvifolia. In Undulata the filaments are very liable to irregularity and generally curved downwards, those of the mule approach nearer in straightness and regularity to those of Curvifolia: the style becomes at last bent upwards, but not so much bent, nor is it at first so short, as in Undulata, of which the style is by degrees considerably prolonged. In some flowers of the mule the style is entirely wanting. The style, or one or more of the filaments of the Amaryllideæ, are occasionally abbreviated or prolonged by accident. In Nerine Undulata they are particularly irregular, in consequence of the distortion of the flower, but in its most perfect state the correspondence of the alternate filaments is evident. Seedlings of Undulata flower when about three years old; the strongest of the mules blew at four years: but seedlings of Curvifolia seem not to flower till they are eight or nine years old. The figure represents a full-sized seed of each of the parents, the largest being that of Curvifolia.

70. Strumária.—Umbel many-flowered, pedunculated; spathe 2 valved; perianth regular; tube, none except an annular connexion; filaments connected at the base, the alternate filaments, generally, more or less adnate to the style in proportion to its thickness; anthers incumbent; style strumous (that is, enlarged below), angular, furrowed, stigma trifid; seeds roundish, few.

1. Augustifólia.—Pl. 29. f. 14. Jacq. Coll. Supp. 48. ic. rar. 2. c. 259, Leaves $\frac{1}{8}$ wide, subacute; perianth

white, lined with red; style with three bifid processes, a little longer than the filaments, of which 3 are free, 3 connate with the style.

2. Truncáta.—Pl. 39. f. 11. Jacq. ic. 2. t. 357. Specim. Herb. Banks. Leaves obtuse, ½ an inch wide; spathe lined with red; flowers white, red at the base and in the bud, filaments shortly connate, 3 adhering to the style.
3. Rubélla.—Pl. 39. f. 12. Jacq. ic. 2. 358. Leaves ¼ wide, flowers red, filaments cylindrically connected half their length, 3 connected with the style.
4. Linguæfólia.—Pl. 29. f. 10. Jacq. C. S. 45. ic. 2. 356. Leaves obtuse, ½ an inch wide; flowers white, lined with green; filaments connected at bottom with the perianth; 3 connected with the style.
5. Unduláta.—Pl. 29. f. 13. Jacq. C. S. 50. ic. 2. 360. Leaves ¼ wide, subacute; flowers undulated, white tipped with red; filaments shortly connected at the base, all free from the style.

This genus is distinguished from all the foregoing by the strumous style. It is not very material whether Strumaria or Hessea be placed next to Nerine, but it seems advisable to keep those with an enlarged style together. Properly Strumaria and Hessea should stand side by side, the former connected with the subsequent genera by its strumous style; the latter by its short erect anthers. There is in the Banksian herbarium, a drawing by Bauer, of a Strumaria without name, which I believe to be an undescribed species or variety; the leaf agrees nearly with that of Linguæfolia; the umbel is represented rather drooping to one side; the spathe short; the perianth not undulated, white with a very faint blush of pink; the dissection having been made before the maturity of the sepaline anthers, the style, which is green, is not full grown, and the stigma not developed; the dissection does not shew the base, nor whether the filaments, which are crowded round it, adhere or not. It was probably a representation of one of Masson's bulbs which flowered at Kew. From appearances, I should think it a variety of S. linguæfolia, with a pink blush instead of a green line outside the sepals. The point of a young leaf and Bauer's dissection are given, pl. 29. f. 15.

71. **Hesséa.**—Spathe bifid; limb regular, tube short; filaments equal, subulate, erect at first, afterwards reflex, inserted at the mouth of the tube; anthers short, erect, inserted at the base, after expansion circular; style filiform; stigma trifid, patent, fimbriated; germen at first very small, swelling large prematurely, turbinate.

1. Stelláris.—Am. stellaris. Jacq. H. Sch. 1. 37. t. 71. There are five specimens in Mr. Lambert's Herb.; one in Dr. Lindley's. The plant has never, I believe, been introduced into this country. The sepals and petals seem to differ a little in colour.

2. Breviflóra.—Pl. 29. fig. 6. Specim. Herb. Banks. leaf Pl. 43. f. 4; pedunc. $2\frac{1}{4}$ unc. erectis, germine parvulo, floribus 14, tubo brevi, limbo $\frac{3}{10}$, (albo?) semipatente, staminibus vix longioribus, stylo breviore. This little plant, which has been long overlooked in the Banks. Herb., and is probably one of Masson's, comes near to Thunberg's Hæmanthus vaginatus, but differs in having the style shorter. Carpolyza spiralis vaginates, but is not his H. vaginatus.

Species vix dubia.

3? Vagináta.—Hæmanthus vaginatus. Thunb. Flor. Cap. p. 297. Leaves 4-6, linear lanceolate, sheathed at the base; segments of the limb lanceolate, acute, shorter than the spathe; scape solitary, smooth, round, a foot long or more, thick as a goose-quill; umbel about 20 flowered; spathe 2-valved, ovate, lanceolate, concave, smooth; peduncles filiform, erect, smooth, 1 inch long; segments equal, acute, white; filaments as long, style longer; stigma trifid.

This genus, as well as I can ascertain, is distinguished from Nerine and Brunsvigia, by its anthers erect and attached at the base, and the near equality of the stamens; from the former by their equal insertion, and from the latter, by the absence of their gibbous union. It is difficult to understand on what principle it could have been united with Strumaria. The name Hessea was given by Bergius to Carpolýza spirális; I know not with what view R. and Schultes can have taken the name

Hessea in preference, seeing that Mr. Salisbury had very many years before published the character of his genus Carpolyza, with a figure and dissections of the plant, in the Parad. Londin. The name Hessea was given, as I understand, in compliment to Mr. Hess, a most respectable Missionary at the Cape, and I am glad to be able to transfer the name, which cannot stand in the place of Carpolyza, to a closely allied genus.

72. Imhófia.—Spathe 2-valved; limb patent; style erect, strumous or thicker below, furrowed; stigma simple or just trifid; filaments equal, enlarged at the base, separate, inserted in the disk, patent. (Quære, whether sometimes adhering to the base of the style.) Anthers short, attached at the base, erect, after expansion circular. Seeds (like those of Nerine) green, with one angle and a rounded back.

1. Filifólia.—Pl. 29. f. 8. Strumaria filifolia. Jacq. ic. r. 2-14. Bot. Reg. 4. 440. Leucojum strumosum, Jacq. ic. t. 361. in icone, non in textu.—Hort. Kew. Leaves almost filiform, channelled; flowers 5-11, segments acute, not undulated, white, lined without with red; style with a great 3-furrowed protrusion below the middle; stigma with 3 short lobes; anthers purple. I have neglected to examine this plant minutely, when in flower; it is said to have a nectareous membrane adhering to the base of the style. It ripens seed freely, and is easily cultivated, if not watered in the summer. Grows near the Cape and Nyland, in sandy places.

2. Crispa.—Strumaria Crispa. Bot. Mag. 33. 1363. Amaryllis Crispa. Jacq. H. Sch. 1. 37. t. 72. Am. Cinnamomea. L'Herit. S. A. 16. 27. Leaves filiform; flowers 7 or more, undulated, white and rose-coloured; anthers purple; filaments subulate; style thick and 3-furrowed.

3. Burchelliána.—Pl. 29. fig. 5. Specim. Burch. Herb. 4954 et 4967. Scapo $4\frac{1}{2}$ unc. spathâ $\frac{5}{8}$, pedunc. $1\frac{1}{4}$-$1\frac{1}{2}$, florib. 7-11, albis, lin. dorsal. (viridi?) perianthio vix $\frac{3}{10}$, subundulato, staminibus longiore; filamentis et stylo basi incrassatis; antheris albis; stigmate simpl. aut vix trifido. Circa Langkloof.

This little plant, found by Dr. Burchell near Langkloof, without leaves in March, approaches to filifolia, but differs in a little undulation of the flowers, lined, as it appears, on the back with green, anthers white, a more simple stigma, and a style (as it seems in the dry specimen), broad at the very base. It may possibly be only a local variety of filifolia.

Var. 2. Viréscens. Specim. Burch. Herb. 2683. Major, floribus 15, albis, virescentibus; stigmate vix trif. lobis obsoletis, absque foliis. Dr. Burchell had considered this, when he gathered it, to be a distinct species; I could discover nothing in the dry specimens to distinguish it, except superior size and a greener hue: but when in flower in Dr. Burchell's garden, it was shewn to Mr. Ker, who, as I learn from Dr. Burchell, said it was Gemmata. If he meant that it was the very plant figured in the B. Mag., the flower of gemmata must be grossly exaggerated in the plate, being twice as large as in the specimen of virescens.

4. Gemmáta.—Strumaria. Bot. Mag. 39. 1620. Leaves $\frac{5}{8}$ wide, ciliated, subacute; peduncles 3 inches; perianth 9-16ths, very much undulated, white, without pale red, with a green mid-rib; style greatly enlarged at the base, so as to occupy the disk; filaments less enlarged than in the other species, adhering to the base of the style (Mr. Ker says, inserted in it; there seems to be no real difference of structure, but that the style intrudes on the base of the filaments); anthers white; stigma at first simple, afterwards trifid.

Only known by the figure and description in the Bot. Mag. I am persuaded that Dr. Burchell's virescens is not the same plant. Its flowers are not near so large, nor undulated; and, according to Mr. Burchell's notes, they have no rose-colour. Mr. Ker mentions a limpid drop between the filaments and style. The name Imhofia having been set at liberty by the union of marginata with Nerine, I have been glad to fulfil the object of its framer, by applying it to a nearly allied genus. It was originally intended for Nerine venusta, but was not defined by any character, nor ever adopted: and its substitution for Nerine, which has been pretty generally adopted, would have occasioned useless confusion, and have been inconvenient to the public. I had not observed the name thus suggested loosely by Heister for venusta, when the genus Nerine was established, or I should have preferred it.

73. Carpolýza. — Umbel pedunculated; spathe 2-valved; limb semi-patent, regular; tube short, funnel-shaped; filaments adnate to the whole tube, the alternate a little shorter; anthers oblong, attached at the base, not versatile; style thick, furrowed, triangular, slenderer upwards; stigma trifid, recurved, fimbriated; germen obovate, 3-furrowed; capsule 3-celled, 3-valved; seeds green, rounded on the back.

1. Spirális.—Specim. Herb. Bank. Pl. 29. f. 9.—Dissections from Salisbury, Paradisus London. 63.—Crinum tenellum. Jacq. Coll. S. 43. ic. r. 2. t. 363. Crinum spirale. Bot. Rep. 92.—Amaryllis Spiralis. L'Her. S. A. p. 10.—Strumaria Spiralis. Bot. Mag. 33. 1834.—Hæmanthus spiralis. Linn. fil. in Hort. Kew.—Thunb. Prod. 58.

A very neat little plant, with filiform spiral leaves, and the lower part of the scape singularly spiral; spathe an inch long, acute, flowers few, sometimes but one, about ¾ of an inch, white; sepals red on the outside, tipped with green; alternate anthers mature first, peduncles about 1½ inch. Found by Masson near Cape Town.

When each successive writer refers a plant to a different genus, as in this case, it may with great probability be surmised that it belongs to none of them. Mr. Salisbury defined the genus and named it, giving excellent dissections, in the year 1807; and nothing but the confusion in which the whole order was involved, could have prevented the earlier adoption of the name he gave to it. The genera Imhofia and Carpolyza bear the same relation to Strumaria, as Hessea does to Brunsvigia and Nerine, distinguished by anthers erect and not versatile, a most decisive feature. Carpolyza differs from Imhofia in the tube, the shape of the anther, the form of the style and stigma.

Suborder 5. Narcisséæ.—Perianth tubed; cup including the filaments; sepaline filaments prolonged, sepals (when unequal, and I believe always), wider than the petals; scape hollow upwards, more or less filled up below; peduncles solid, uneqnal. The principal fissures of the crown when it is three-lobed opposite the sepaline ribs, the indenture of each lobe opposite the petaline; style mostly tripartible, sometimes by accident (in semidouble or degenerated double flowers) tripartite; ovules in from 2 to 4 rows which are mostly imperfect and confused; seeds with a black shell.

Mr. Haworth was bold to say that "it was better for his future reputation that many years had elapsed without his genera and species of this section or suborder having been adopted by others, for that adopted they will be, and then must be proved his having seen just so far before his competitors;" that "his characters are founded on the solid laws of botanical proportions," and that "he knows their validity." I wish to give Mr. Haworth full credit for his labours, though, indeed, I cannot say that his descriptions always tally with the heads under which he places them; but after a careful inspection of the second edition of his Monograph, without any wish except to ascertain the truth, I must take leave to say that it is utterly impossible that the scientific public should ever adopt his generic characters, because they are founded on trivial features, in some cases unfit even to support a specific distinction; and although the names, which Mr. Salisbury first published without any definitions will be properly retained, they must be attached to generic characters very different from those given by Mr. Haworth. The erroneous features on which he has built are the relative proportion of the tube, limb, and cup, the form of the margin of the cup, the colour of the flower, the length of the filaments and style, the smoothness of the scape, the colour and shape of the leaves, not one of which is fit to be made the foundation of a generic character. It sometimes occurs that throughout a genus there may be a very striking disproportion between the tube and limb, which is so manifest that it is tempting, and pretty safe, to insert it in amongst the features, though it would be more properly subjoined as an observation; the proportion of the cup to the tube may be more important, and a peculiar colour may be found to coincide with the limits of some genera, but neither can support a generic character which is not founded on some more decisive distinction. Mr. Haworth is not, however, consistent even in the use of the features he adopts; for he makes *the style included* a generic feature of Oileus, yet *style always included* characterises one variety, and *style as long or longer than the cup* another variety, of even the same species of Tros, and I find his specific distinctions equally inconsistent. I need have no hesitation in pronouncing that such characters cannot be adopted. The exact proportion borne by either the tube or the cup to the limb is by the analogy of other genera in this order to be considered as nothing but a specific feature; the relative length of the filaments and style to the limb is scarcely to be relied on as such; the form of the margin of the cup is utterly insignificant; and the genera Calostemma and Eurycles shew that even its absolute incision is not to be depended upon, unless coupled with some decisive feature to which it may be subsidiary; the form of the tube is variable in many genera of plants, which may be well exemplified by Petunia nyctanigeniflora, in which it is nearly cylindrical, and phœnicea, in which it is ventricosely campanulate, yet the hybrid or mixed produce of the former plant, impregnated by the second, ripens seed with me more freely than either of the parents. Vallota and Cyrtanthus shew that a longer or shorter adhesion of filaments, which are adnate and not actually inserted, is a variation that occurs even in the same umbel in this order; a little greater or less comparative length of the style occurs sometimes in the same umbel of the Narcissiform plants, and the length of the filaments is exceedingly variable in many species of Amaryllideæ.

An equal or unequal adherence of the sepaline and petaline filaments, a decided difference in the form and attachment of the anthers, a decided upward flexion compared with a decided rectitude or connivance of the stamina, may, as far as my observation extends, be generally relied upon as signs of a generic diversity. Applying these principles I cannot hesitate in pronouncing Corbularia, the hoop petticoat, and Ajax, the daffodil, to be quite distinct from Narcissus, and the rest of the Narcissean fraternity. I find a further difference of structure in the stamens distinguishing Queltia, Narcissus, and Hermione, which however approximate more nearly to each other.

The next point of importance is to inspect the fruit, and see whether any diversity thereof corresponds with the diversity of the stamens. I find the capsule of Ajax turbinate and not erect, sloping from the peduncle if the scape continues erect, straight if it falls to the ground, preserving an horizontal position; I find the like position in the vernal species of Narcissus, and a sloping posture also in Queltia. In Corbularia and Hermione I find the fruit erect from the time it begins to swell. There is a difference of stamen in the jonquil and an erect capsule, and the autumnal Narcisseæ have also an erect capsule, and I am doubtful whether, on close inspection of the latter, they may be found to disagree with Hermione, and perhaps form a different genus with the jonquil. I find the seed of Ajax roundish, wrinkled with an elevated wrinkled raphe and chalaza; of Ganymedes approaching to that of Ajax; of Corbularia irregularly flattened, wrinkled, and somewhat foliaceous; of Hermione shining, smooth, properly compressed with a rounded back, irregularly angular by contact, the margins of the angles sulcate on the side, and the raphe sulcate with elevated margins; that of Narcissus roundish, sometimes angular by contact, minutely lined or wrinkled with an elevated raphe and chalaza. I have not however had sufficient opportunities of tracing the diversities of the seed, and I have seen so much outward difference of appearance between the seeds of two Hermiones, that I cannot describe the seed of Hermione with any confidence. I have not been able to obtain that of any Queltia, except the doubtful species Jonquilla, which agrees with the autumnal Narcisseæ in having an erect capsule. I have admitted the genus Ganymedes with very great hesitation, having been disposed to look upon it as a section of Queltia. It forms, however, a very marked group, and I find no intermediate plants to connect them. Mr. Salisbury had a remarkable intuitive perception of differences which has generally proved to be correct, though he was unable to give any satisfactory account of the existing marks of distinction. I am indebted to him for nothing in this natural order, but naked names of genera, excepting Acis and Carpolyza which he defined in the Parad. Lond. He brought his MS. to me one morning, and read to me some names and observations of little importance from it, but did not let me look into it, and I believe it contained no finished generic characters. He could give me no account of the features on which he built his separations, except that he had founded Hymenocallis on two-seeded cells, which was quite inconsistent with the fact, the range of the genus extending from 2 to 8-seeded cells. The names of the Narcissean genera and Eurycles were published by him in the Hortic. Trans. without any explanation of his views, and I doubt his having ever put them on paper, and I apprehend that he had forgotten the points which had led him to a just conclusion while the plants were under examination. The affinities of the vegetable creation were the avowed object of his MS., and he informed me that he expected his future botanical fame to rest upon that foundation; but I believe he left nothing sufficiently finished to be fit for publication.

Miller states that the Narcisseæ usually flower the fifth year from seed, but finer the second and third season than the first. He says that they should not be removed above once in three years, because they flower weaker after being moved, but that jonquils, if left standing, grow long in the bulb, and do not flower well; and he recommends removing them every year. Light loam, with a little dung, is recommended by him, if very light to be strengthened. The bulbs should be set by the beginning of September, and I believe the less time they are kept out of ground, the less they will suffer from removal. There is, however, another cause which affects them when removed, that the wet earth lies too close upon the bulb, and when in a tuft, the wet drains through the interstices between the bulbs. Haworth recommends loam, an elevated border, and a covering of leaves in winter, which is certainly right for most of them; but some are natives of rocky and stony situations, and some appear to like sandy soil. N. majalis is stated in Eng. bot. to have naturalized itself on a heath in Kent. There can be no doubt that they will be less liable to rot if the border be raised, and that good drainage and a winter coat of leaves, is essential for the tenderer sorts, and some of them will not be safe in the border without further protection.

74. CORBULÁRIA.—Hoop-petticoat. Style and filaments declined, recurved; anthers short, attached at the middle, incumbent, versatile. Filaments successively matured; the sepaline adhering to the tube near the base, the petaline inserted at the base; tube funnel-shaped, cup large funnel-shaped (longer than the tube); limb little conspicuous, segments slender.

1. Cantábrica.—Haworth. Fl. omnino candido. Clus. 166. f. 2. Flower white, cup crenate, style included. Totus albus. Swert. Flor. t. 28. fl. omn. albo. Morris. s. 4. t. 23. fl. white or whitish, brims

a little uneven. Park. par. p. 106. no figure. Albicans. Haw. Mon. with an erroneous reference to Park. par. 106. f. 4. style erroneously stated to be included and cup quite entire. This white species, of which the limb is probably a little tinged with greenish yellow on the outside, was formerly well known in this country and Holland, but seems to have been long lost. It is native of Biscay and the Pyrenees, There is no reason to suppose that two white varieties were ever known. If there be an old engraving with a prolonged style, no dependance can be placed on it.

2. Bulbocódium.—Linn. who cites "Juncif. 2. fl. flavo leviter et tenuiter per oras fimbriato. Clus. 166. f. 4." Clusius's plant has the style shorter than the cup, which is described as slightly fringed on the margin. It grows between Seville and Lisbon, and according to Brotero, near Lisbon and Coimbra. Mr. Haworth's assertion that this is Bulbocodium of Linnæus's herbarium is quite erroneous. His specimen has the limb $\frac{3}{8}$ths of an inch shorter, the style $\frac{3}{8}$ths longer than the cup, the leaves much longer than the scape. It is certainly tenuifolia, but we must look to what Linnæus published, and that cannot be reversed in consequence of his having confounded another species with it afterwards in his herbarium, or considered it as a variety not worth distinguishing. He did not found his characters of Narcissi on the specimens in his herbarium, but in some cases, as in this, on the faith of other writers, and he did not distinguish two Corbularias. The quotation attaches the name bulbocodium to Clusius's fig. 4.

Var. 1. Lobuláta. *Haw.*—Clus. 166. f. 1. Park. par. 107. f. 7. margin waved and indented; flowers in April.

Var. 2. Serótina.—Sweet Br. f. g. ser. 2. 164. N. Bulbocodium. Bot. Mag. 3. 88. Park. par. 107. f. 8. Turgida. Salisbury. Flowers in May. Said to grow on the Pyrenees, and to be abundant near Tarbes. Cup undulately-lobed. *Haw.* Parkinson states that this plant flowered a month later than the other three, which he describes. This is the hardiest kind of Corbularia.

3. Conspícua. *Haw.*—Var. 1. princeps. Park. par. 107. f. 6. Sweet Br. fl. g. ser. 2. 326. Taller and larger than Bulbocodium. Cup plicate, margin repand, style longer, leaves erect. April.

Var. 2. Minor.—Both varieties are cultivated at the Chelsea gardens, and are conspicuous by the erect leaves and long scape. I have not seen the flower.

Var. 3? Gigas?—Theatr. flor. t. 21. Whether the fig. referred to represents v. princeps or a larger variety, otherwise unknown, I cannot pronounce. I find reason to place little faith on the correctness of the engravings of that period.

4. Tenuifólia.—Var. 1. Princeps. Sweet Br. f. g. t. 114. Bulbocodium. Specim. Linn. herb. sed non Linn. Syst. Leaves very narrow, cup 6·lobed, limb ⅜ths shorter, style ⅜ths longer, than the cup. I had hundreds of bulbs of this plant in my garden for many years, but one inauspicious season exterminated them.

Var. 2. Minor.—Smaller in all its parts. Both varieties are cultivated in pots in the Chelsea garden. In Mr. Bentham's herbarium I find a singularly minute variety of this plant stated to grow in Italy generally, the style exceeding the cup.

5? Obésa.—Salisbury Hort. Soc. Tr. 1. 350. Cup entire inflated, (style exceeding the cup, Haw.) leaves recumbent on the ground. I have not been able to discover this plant, which Haworth states to flower in March. Salisbury had it from Tangiers, and says that it grows also in Spain and Portugal, and is a tender plant. He quotes Clus. Pseud. n. Junc. 1. p. 165, oris non sinuosis aut fimbriatis, and says, *edge of the cup even. Fl. April.*

Aúrea, taken up on the authority of a bad figure in Morison, I have no hesitation in rejecting. It is quite vain to trust to minute differences in such engravings. There is a very large specimen figured Theatr. flor. t. 21. which Mr. Haworth names Gigas. I cannot rely upon the engraving, and refer it to Conspicua.

75. Ajax.—Daffodil. Style thick, straight, subulate, three-furrowed, tripartible; filaments straight, clustering round the style, adhering to the lower part of the tube, growing into the back of the anther below the middle; anthers erect, straight (the point rarely a little curved), linear, margins of the lobes bent back, meeting behind, and enveloping the filaments. Tube funnel-shaped, crown nearly cylindrical, longer than the tube, equal to or longer than the limb, which is conspicuous; capsule sloping; seed roundish, wrinkled, with a prominent wrinkled raphe and chalaza.

1. Minor.—Var. 1. Princeps. N. minor. Linn. Cuneifolius. Haw. Scape internally filled up near to the top; filaments adnate close to the base unequally, see pl. 38. f. 32.; style a quarter of an inch shorter than the cup; limb semipatent, pale yellow; segments not imbricating; tube half an inch long; cup 6-lobed, crenate at the edge; leaves glaucous. Native of the Pyrenees. Linnæus (s. 2. ed.) describes minor with flowers nodding, three times smaller than Pseud. Nar.; scape scarcely striated; margin of the cup 6-lobed, undulate, crisp; segments of the limb distinct at the base. Mr. Haworth, therefore, in separating the varieties, affixed the name minor to a wrong one, with the segments imbricating.

Var. 2. Humílior.—Minor. Bot. Mag. 1. 6. Minimus, absque ratione. Haworth. Leaves closer to the ground, but before expansion touching it; segments imbricating.

Var. 3. Cuneifolius.—Salisbury. Pl. 39. f. 24. Spec. Herb. Banks. Segments of the limb not imbricating.

Only one of the above is known to me, except the specimens in the Banks. Herb. to which the names are affixed by Mr. Salisbury; but Mr. Haworth states that he was acquainted with the three, which he injudiciously distinguished as species, and two other varieties, one with leaves larger and more erect than minor, the other narrower. They are very hardy, and flower in March.

Var. 5. Eréctior.—Minor. Haw. This Mr. Haworth fancied to be the N. minor of Linnæus's herbarium. Mr. Haworth adds two other varieties; one with leaves still more erect, another with leaves narrower. It is quite immaterial what variety Linnæus may have placed in his herbarium as identical with minor. The name belongs to the plant he first distinctly described, whatever confusion he may have afterwards made in this as in many other cases, either not observing the difference, or not thinking it worthy of notice.

Var. 5 ? Nánus. *Haw.*—Only known to me by his description; probably a variety of minor, since Haworth first called it minor δ. conspicuus. N. Rev. p. 112. Sulphureous, semipatent, limb half as long again as the cup, which is yellow, lobed, and crenate. He notices a narrow-leaved variety with limb quite patent, and a double variety. I possess a bulb of Haworth's nanus, but have not yet seen its flower.

Var. 6. Púmilus.—Pl. 39. f. 23. *Salisbury*. Spec. Van Royen. Herb. Banks. from the Leyden Garden. A very diminutive variety of minor.

2. Pseudonarcíssus.—Cup the length of the limb. Linn. Scape two-edged, striated, much more hollow than that of minor; style $\frac{1}{2}$ to about $\frac{3}{4}$ of an inch shorter than the cup; filaments adnate close to the base of the tube; tube about $\frac{3}{4}$ long, sometimes $\frac{5}{8}$; sepals varying in width from $\frac{5}{8}$ to $\frac{7}{8}$ths; cup sometimes with six lobes cleft almost regularly, sometimes with none; more reflex, when cleft; about $1\frac{5}{8}$ long; limb paler yellow than the cup.—Filaments adnate near the base of the tube, with a marked inequality. See Pl. 38. f. 40.

Var. 1. Ryticárpus.—Haw. capsulis rugosis. That which grows wild in the parish of Spofforth, in Yorkshire, and the neighbourhood, has the germen very wrinkled as soon as the flower begins to fade, and is probably the variety thus named.

Var. 2? Festális.—Pl. 43. f. 3. Salisbury. The specimen in the Banks. herb. to which Mr. Salisbury has affixed his name festalis is a plant of small size, seemingly intermediate between minor and Pseudonarcissus, and I am inclined to think it may be Mr. Haworth's Nanus. The variety Engl. Bot. t. 17. I suppose, has smoother capsules than that which is found in Yorkshire, but I have not had an opportunity of comparing them. Haworth enumerates three shades of colour, besides two double varieties, and his A. serratus and præcox are two more. A reference to plate 40. f. 5, 6, 7, 8. which represent four varieties that grew in the same wild sod of about 16 inches diameter, taken up at random in a pasture at Spofforth before the flowers were blown, and exhibit great diversity of proportions, especially the limb longer and shorter than the tube, and some difference of colour, are sufficient to shew the futility of the features by which the species of Haworth are distinguished. Fig. 5. and 6. are from flowers which had been pressed under paper before the outline was made, and the apparent width of the tube must not be compared with 7 and 8, which had not been pressed, but 5 may be compared with 6, and 7 with 8, and perfect reliance may be placed on the exact correctness of the outline. All had the same wrinkling of the immature capsule. I entertain doubts whether any plant of this genus was originally indigenous in Great Britain. They seem to me to have remained in the soil in the site of old cottage gardens long destroyed, and to have spread wherever a root may have happened in the course of centuries to establish itself, but I cannot pretend to assert that such is the case.

Var. 3. Nóbilis.—Haw. Pseud. Red. Lil. 158. Andersoni. Sabine MS. Limb more patent; scent unpleasant; tube about $\frac{3}{4}$ of an inch, cup $1\frac{1}{2}$ long, irregularly lobed, plaited, crenulate, a little recurved; segments equal to the cup, rather acute, tortuous; sepals $\frac{5}{8}$ths wide, petals not $\frac{1}{4}$; style 11-16ths shorter than the cup; peduncle 5-16ths long; germen $\frac{3}{8}$; leaves half an inch wide, a little glaucous.

Var. 4. Telamónius.—Haw. This agrees with the other varieties in having the limb paler than the cup, the tube tinged with green, the peduncle from $\frac{1}{4}$ to $\frac{1}{2}$ an inch long, as well as in the length of the style. Mr. Haworth states that in rich soil this flower attains an unusual length, but I have not seen it in such a state.

Mr. Haworth notices three seminal varieties of Pseudonarcissus, differing in having the limb paler in different degrees, and he distinguished another as a species under the name Serratus, with three variations, the cup being specified as serrate, though he also calls the cup of Pseudonarcissus serrate; and the only difference that can be extracted from his characters of Pseudonarcissus and Serratus are that the limb of the former is equal to the cup, and the latter shorter, though with his usual inconsistency he has a variety of Serratus limb nearly equal. The uncertainty of that feature has been stated above.

I am informed by a gentleman, who has paid much attention to the wild bulbs of Italy, that Pseudonarcissus in the vicinity of Naples is oftener found in a wild state with double than with single flowers. Such plants, I think, must be vestiges of ancient horticulture. I am also told that there are many variations of this plant peculiar to different localities in Italy.

3. Bícolor.—Linn. Sys. ed. 2. Filamenta prope tubi basin adnata, inæqualitate ferè obsoletâ; stylo vix semunciam coronâ breviore. Tube about half an inch long, or 1-16th more, very pale; petals very little narrower than the sepals; cup yellow, imperfectly lobed; style about half an inch shorter than the cup; filaments adnate near the base of the tube, with the inequality almost obsolete. See Pl. 38. f. 36. 38. 39.

Linnæus's specimen of N. bicolor has the tube only $\frac{3}{8}$ long, and probably belongs to the next closely allied species, but his comparison of the plant with Ps. nar. (ed. 2.) points to this species with the longer tube. There is no reason for supposing that he founded the species on the specimen in his herbarium, when that is found to disagree with his published description, and it would be inconvenient to reverse the names at present in use.

Var. 1. Lorifólius.—Haw. N. bicolor. Bot. Mag. 29. 1187. Flower sweet, but not so fragrant as breviflos. Limb about ⅛th of an inch shorter than the cup; sepals ⅞ths wide; petals scarcely 1-16th narrower; cup 1½ long, lobed irregularly, plaited, crenate; style scarcely half an inch shorter; leaves 9-16ths wide.

Var. 2. Bréviflos.—Haw. Limb a little tortuous, just shorter than the cup; sepals ⅞ths wide, petals ¾ths; cup 1⅜ long, almost regularly lobed; style half an inch shorter; leaves 5-16ths wide. Delicately fragrant.

Var. 3. Anceps.—Haw. Scape more flattened; scent powerful, but less agreeable, like the sour-creamy smell of gladiolus hirsutus; sepals an inch wide, petals ⅞ths; cup near 1½ long; tube ⅝ths.

4. Tubæflórus.—Filamenta tubi ipsi basi adnata inæqualitate fere obsoletâ, stylo ultra semunciam coronâ breviore; tubo vix semunciali; limbo pallido laciniis latis.

Var. 1. Princeps.—Tubæflórus. Salisbury. Pl. 38. f. 34. This and the following variety differ from all the varieties of bicolor in having the filaments parting from the tube still nearer to its base, as may be seen by the outlines I have given, but they are very closely akin to bicolor, and Linnæus seems by his specimen not to have distinguished them. Tube ⅜ths; limb broad, patent, very pale sulphur, 1⅜ long; cup equal, yellow, margin reflex, irregularly lobed and serrate.

Var. 2. Crenulátus.—Sabine MS. Pl. 38. f. 35. Distinguishable from tubæflorus chiefly by the cup being less cleft and recurved at the margin, which gives it the appearance of being longer; but I have seen so much variation in the crown of tubæflorus in bulbs that were offsets from the same stock, that I doubt its being a variety permanent by seed.

5. Moschátus.—Style ¼-½ shorter than the cup and longer than the stamens; tube ½-¾ inch long, flowers whitish. Linn. ed. 2. says, "cup cylindrical; margin obsolete, repand, not toothed or crisp;" but it is quite needless to inquire which of the white-

flowered varieties he had in view, for it is preposterous to distinguish them as separate species.

Var. 1. Candidíssimus.—Red. lil. 3. 188. N. Moschatus δ. Bot. Mag. 32. 1300. Segments tortuous, sulphurescent, turning white, equal to the cup; flower less; tube half an inch long; style a quarter of an inch shorter than the cup.

Var. 2. Tortuósus.—Haw. N. Moschatus Bot. Mag. 24. 924. Limb shorter than cup; not so white, larger; tube above ¾ inch long; style ½ inch shorter than the cup.

Var. 3. Cérnuus.—Haw. Sweet. Br. f. g. s. 2. v. 2. 101. Sulphurescent creamy white.

Var. 4. A'lbicans.—Haw. Park. par. p. 100. t. 101. f. 1. Segments of the limb ovate-lanceolate, flatter, whitish; cup crenate, sulphurescent. This variety Mr. Haworth says that he saw in 1831 at Young's Nursery at Epsom.

There is a double-flowering variety of Ajax Moschatus in cultivation, of which the root is communicated to me by Mr. Penny, but I have not seen the leaf or flower. Haworth refers it to Parkinson's lesser variety. It is represented in Sweet's Br. fl. g. ser. 2. v. 2. 101.

5. Lúteus. mihi.—Perianthium luteum concolor; ped. et tubus ¾ unc. filamenta prope basin tubi inæq. adnata; stylus coronâ circ. unc. brevior. Pl. 38. f. 33. Perianth all yellow; ped. and tube ¾ of an inch long; filaments adnate, unequally near the base of the tube; style about an inch shorter than the cup.

Var. 1. Máximus.—Haw. The finest variety.

Var. 2. Májor.—Bot. Mag. 2. 51. Found on hills near Limoges.

Var. 3. Propínquus.—N. major β. Bot. Mag. 32. 1301. f. sup.; cup straighter than the two former. I have a variety with the cup ⅛ of an inch longer and more expanded, which is probably Spurius of Haworth, but not worth distinguishing.

Var. 4. Obvalláris.—N. major. γ. Bot. Mag. 32. 1301. f. ima. N. Sibthorpi. The lower of the two figures in the plate, Bot. Mag.

Mr. Haworth has, besides an Ajax Lobularis growing near Tenby in Pembrokeshire; limb exactly twice the length of the tube, cup three lines longer, six-lobed, which he considers the stock of the common double deep-yellow daffodil; Rugilobus, limb a third part longer than the tube, cup 6-lobed, wrinkled; and Cambricus, differing from the last merely in the lobes being crenate and but little wrinkled, and he makes them three distinct species! They have been noticed by no other person, and belong, as far as I can judge, to Pseudonarcissus, having the limb darker than usual.

6? Abscíssus.—Haworth. Park. Par. 107. f. 1. Pseudonarcissus tubo quasi abscisso. A daffodil with the cup as if its margin had been clipped. This plant and the following have the limb paler yellow than the cup, and are probably varieties of Pseudo-narcissus. Parkinson received this from the Pyrenees.

7? Hexanguláris.—Haw. Park. Par. 101. f. 5. Cup hexangular, clipt. These, together with albus, and two other daffodils, differing from minor in having the cup, as if clipt (but only known by the plates in Rudb. Elys. 68. f. 4. and 72. f. 15), have been most injudiciously erected by Mr. Haworth into a genus Oileus, on account of no other peculiarity than the entire and straight margin of the cup. They have been long lost; and the description of them is too imperfect to enable their proper place to be ascertained with certainty. The two former are probably referable to Pseudo-narcissus, the two latter to minor. Haworth has an Ajax albus from Rudb. Elys. 70. f. 7. said to have the perianth white, the cup not fringed, and the style exceeding; the plant about equal in size to minor. On reference to Rudbeck, I find a figure with something indistinct like a curved style. In the text he does not call it white, as Haworth says, but white with a large yellow cup, and he mentions three varieties, one with the cup fringed, and one not fringed. No reliance can be placed on such a figure and description. It comes nearer to Ajax Sabinianus than to any other plant.

N. Cyclamíneus (Rudb. Theat. flor. 20. called there N. Hispanicus minor, luteus, amplo calyce, foliis reflexis) is another absurdity which will never be found to exist. It is probably an execrable representation of Ganymedes capax with the margin of the cup incorrectly given; and, looking at the rest of Rudbeck's figures, I have no hesitation in rejecting it as a non-entity. There is no account of the quarter from which it was obtained.

9. Sabiniánus.—Pl. 38. f. 41. Bot. Reg. 9. 762. Limb white, $1\frac{1}{8}$ inch long; cup yellow, $\frac{7}{8}$; tube $\frac{5}{8}$; style $1\frac{1}{2}$ long; petaline filaments adnate, $\frac{1}{4}$ of an inch from the base of the tube, sepaline near $\frac{3}{8}$.

This is a very distinct and remarkable species, which was brought to notice by a specimen and bulb, sent (as I am informed) to Mr. Sabine from the Botanic Garden at Oxford, where it may have been growing unnoticed for the last two centuries, as very little attention seems to have been paid to its old inhabitants. Mr. Sabine, who has paid great attention to the Narcisseæ, having appeared to think that it was not a natural species, but a cross-bred garden production, I have given particular consideration to that point, and I think it must be a natural species. The reasons for suspecting a spurious origin are, its departure from the other known species of Ajax in a higher adhesion of the filaments to the tube, a very little tendency to a curvature of the anthers, and a shorter proportional cup, and in all those features it draws nearer than any other species of Ajax to the general character of the genus Queltia. Two considerations present themselves: in the first place, whether the plant offers any indications in itself of a spurious and imperfect structure, such as might be expected from a bigeneric mule, or a plant cross-bred between two sections of a genus, differing in structure, if they be considered as forming one genus; secondly, whether we know any species of Ajax and Queltia, from whose accidental intermixture in cultivation, this particular form of plant could seem likely to have been produced. I find no indications of imperfection; the ovules are plump and well defined, and have the usual form, with the raphe and chalaza usually observable in other species of Ajax; nor did I observe in the fresh specimen any apparent sterility of the anther. I have known no intermixture of any two vegetables, so well distinguishable from each other as Ajax and Queltia; and, if their union can possibly take place, I should conceive the produce must be sterile and imperfect. If that consideration be passed over, it is evident, that as it has a yellow cup and a whiter limb than any species of Ajax, it must (if cross-bred) be derived from a two-coloured Ajax and a Queltia with a white limb; and the only such Queltias that we have are Macleaana, and Montana with its varieties; but there is decisive proof that it cannot be so bred, because its style is as long as that of any two-coloured Ajax, and the style of the two white-tinted Queltias is from half to $\frac{3}{8}$ths of an inch shorter; the style of the cross-bred plant would have been therefore abbreviated, instead of being as long and proportionally longer. The style of Q. incomparabilis is also quarter of an inch shorter, and the same objection applies to it besides, that the palest variety of that plant has not the limb so white as A. Sabinianus, and could not therefore by its influence have effaced the yellow tint of the parent Ajax; besides which, the limb of the whitish incomparabilis is 1$\frac{3}{8}$ths of an inch long, and that of the two-coloured A. bicolor and tubæflorus in their varieties being longer than that of Sabinianus, the cross-bred plant would not be likely to have it abbreviated so as to be $\frac{3}{8}$ths of an inch shorter than that of either parent. It does not approximate in any manner to the reflex species forming the genus Ganymedes, nor to N. poeticus, nor to the Hermiones; and any cross, except with the Queltias above named, would have produced a still more different result, I think therefore that I must discard the suggestion of its hybrid origin, notwithstanding my respect for the quarter from whence it has been derived. I hope that I shall be able to obtain a bulb of it, being very desirous of more intimate acquaintance with the plant by cultivating it. Haworth's genus Oileus, without a single feature applicable to a generic character, contains the varieties of Ajax, which are distinguished only by the margin of their cup being even and not in the least reflex, and whose existence depends on the faith of old books. His Diomedes unites Ajax Sabinianus with Queltia Macleaana, the two plants through which the genera approximate, but which are much more essentially different from each other than from the other species of their respective genera.

76. Ganymédes.—Style straight, slender; filaments adhering to the upper part of the tube with greater diversity than Queltia; sepaline stamens more prolonged; limb decidedly reflex; (cup equalling or shorter than

the limb; tube slender, drooping; capsule erect) seed oblong with elevated raphe and chalaza. Plants with a small bulb and leaves, scape slender, and constitution delicate; 2-7-flowered. The anthers require further examination; those of a dry specimen of G. striatulus now before me are not like those of a Queltia; I have had no opportunity of examining a fresh anther of Ganymedes, since I have fully investigated the structure of the other genera.

1. Capax.—N. Caláthinus. Red. Lil. 3. 177. Perianth pale yellow; tube and cup each about $\frac{5}{8}$ths, limb about $\frac{7}{8}$ths of an inch long: style shorter than cup. Native of the isles of Glénan dep. of Finisterre.

2. Refléxus. -Brotero Flor. Lus.—N. Calathinus Red. Lil. 410. Perianth sulphureous white; tube and cup each about $\frac{7}{8}$, limb $\frac{1}{4}$ inch long; style shorter than the cup. On the mountains of Gerez, near Amaranta and elsewhere in Portugal, and in the isles of Glénan. The Portuguese plant is called sulphureous white, that of Glenan is figured quite white by Redouté.

3. Pulchéllus.—Pl. 39. f. 16.—N. triandrus, v. luteus. Bot. Mag. 31. 1262. Sweet Br. f. g. Ser. 2. t. 99. Tube $\frac{7}{8}$, limb about $\frac{7}{8}$, yellow; cup about half an inch, very pale.

Var. 2.—Parvicórona, misapplied by Haworth to striatulus with which it does not agree; the main difference of striatulus being the prolonged style.

4. Cérnuus.—Illus cernuus. Haw. N. triandrus. Bot. Mag. 2. 48. Tube and cup about $\frac{5}{8}$, limb $\frac{3}{4}$ long, whitish. Style shorter than the cup according to the Bot. Mag. though Haworth in his character of Illus says longer.

N. triandrus of Linnæus agrees with this, except that it is called absolutely white, but there may exist a whiter variety than that figured in the Bot. Mag. The name which he gave by a great error, having supposed it to bear only three stamens, because the petaline were hid within the tube, cannot with any propriety be preserved.

5. Cóncolor.—Sweet. Br. f. g. Ser. 2. 113. Perianth pale yellow; tube about $\frac{3}{4}$ long; cup not $\frac{3}{8}$; limb $\frac{5}{8}$; style exceeding the cup.

6. Striátulus.—*Haw.* According to Haworth, style exceeding the cup; segments yellow, tortuous, not overlapping at the base, cup sulphureous white, faintly striped, one-third the length of the limb, margin very repand. This little plant is cultivated at the Chelsea Garden, and Mr. Anderson assures me that it is very distinct. It bears three or more flowers.

7. Nútans.—N. trílobus. Bot. Mag. 24. 945. not trílobus of Linnæus. Cup deeper yellow than the limb, style much longer.

N. totus albus reflexus, Morison v. 4. t. 9. f. 13. taken from Swert Florileg. is a very bad representation of a white reflex 3-flowered plant; with the style not visible. It is too bad a representation to deserve much credit; but it is certainly not juncif. alb. *Park. par.* 93. *f.* 1. which is identified with it by Haworth, for that plant has not a reflex limb, and is probably N. dubius of Redouté, an Hérmione.

N. coronátus Rudb. El. 75. f. 6. is a 2-flowered plant, with the limb not reflex; the figure was not taken from a living plant, but had reference to N. coronatus Lobel, i. e. a one-flowered white Ganymedes, with the style salient, of which Rudbeck's is an unfaithful copy. The other plant, which has been called coronatus, or Coornei, from an execrable figure in Morison and Rudb. El. is copied by them, and others, with like infidelity from Lobel. advers. and called white, though Lobel says, white with a large yellow cup. Lobel states that he never saw the flower, but gives the representation from a drawing, by Mr. C. Coorne, sent to him in England, from the Continent, in 1604. The drawing has been evidently made from a withered flower, of which the limb was quite shrivelled. It was most probably Ganymedes striatulus, as the style was longer than the cup. Little dependance is to be placed on the reported colour of an old drawing from a withered specimen, made by an unskilful person. The result of a careful examination of the old engravings of Narcisseæ, is that the various authors copied from each other with great inaccuracy, and not from nature, and that no faith is to be given to any remarkable appearance in their works which shall not be verified by specimens. N. coronatùs and Coornei must be expunged.

A root called N. capax flore pleno is communicated to me by Mr. Penny. It is stated by Haworth to be the double of Redouté's calathinus, Lil. 177. whether correctly or not, I have yet had no opportunity of judging.

Haworth's genus Assaracus is a specific description of the yellow and the white reflex Narcissi, Ganymedes calathinus of Redouté, Lil. 410 and 417. His Illus is a specific description of Ganymedes cernuus, the triandrus of Linnæus, separated as species, the latter being described as having the limb a little longer, and the scape more flattened.

77. Quéltia. Mock-narcissus.—Style straight, more or less attenuated; filaments adhering alternately to the upper part of the tube, straight, affixed to the back of the anthers below the middle; anthers linear, erect, recurved, with the margins of the cells meeting behind, above the attachment, but not enveloping the filaments, (tube sub-cylindrical, more or less widened, crown shorter than the limb) shorter than the tube, or nearly equal.

1. Macleaána.—Pl. 39. f. 1. N. Macleai. Bot. Mag. 52. 2588. Diomedes minor. Haw. Park. Par. 71. f. 7? Tube 9-16ths, cup half an inch long, yellow; limb ¾ white; style ⅛th shorter than the cup, ¼ longer than the anthers. This species perfectly agrees in material points of structure with the genus Queltia; it approaches nearer to Ajax than the rest, in the greater proportional length, and perhaps a little less expansion of the cup, points which are not of absolute importance, and do not affect the generic character. Its union with A. sabinianus, in a separate genus by Haworth, is evidently erroneous. They form the approximating points of the genera to which they belong respectively, but they do not agree with each other in structure. This plant is a perfect Queltia. I think Parkinson's plant, above quoted, may be the same, and I recognize an appearance very like to it in the Theatr. flor. with wider segments, which seems to have escaped Mr. Haworth.

2. Montána.—Pl. 39. f. 4. Bot. Reg. 2. 133. N. montanus. Park. Par. 71. f. 6. Tros poculiformis. Haw. Perianth white; tube 11-16ths, cup ½, limb ⅛th of an inch long; style just exceeding the anthers,

about $\frac{1}{8}$th shorter than the cup. Mr. Haworth had a variety one-third smaller.

Var. 2. Galanthifólia.—Tros. *Haw.* said to differ in having the limb more expanded and tortuous, and the cup more plaited; the style sometimes exceeding it. There is some apparent difference in the bulbs, but I have not seen the flower of the latter, which seems to be of more difficult culture.

3. Fœ'tida.—Leaves rather glaucous; tube $\frac{3}{4}$ to one inch long, shorter than the limb, stout, wider upwards and strongly six-ribbed; limb patent, subtortuous, $1\frac{1}{4}$ to $1\frac{1}{2}$ long; cup plaited, six-lobed, about half an inch long, $\frac{3}{4}$ to 1 inch wide. (Flower stinking in all that I have seen, and petals more tortuous than the sepals).

Var. 1. Incomparábilis.—Bot. Mag. 4. 121. Cup a little darker yellow than the limb.

Var. 2. Aurántia.—Pl. 39. f. 5. before expansion. N. Gouani. Red. Lil. 158. Cup edged with a deeper colour, tending more or less to orange. Of this I have two variations, and Redouté's plant differs a little; a specimen from Mr. Sabine was not exactly similar to any of the three. The double variety is called Butter and eggs.

Var. 3. Semipartíta.—Pl. 39. f. 6. A marked variety, with a paler tint of yellow, the cup more patent, regularly and deeply lobed.

Var. 4. Cóncolor. *Haw.*—Homochroos. *Schultes.* N. omn. max. fl. et cal. flavo. Park. Par. 68. 2. This plant is only known by the account of Parkinson, who says it differs from incomparabilis in nothing but having the cup of the same colour as the limb, and he adds that it is sometimes 2-flowered. It has not been forthcoming in our days; the double variety called sulphur-crown may possibly have sprung from it; but I understand that a little appearance of darker colour in the middle is observable in the doubling of that flower.

Var. 5. Grísea.—Pl. 39. f. 7. N. max. griseus cal. flav. Park. Par. 69. 3. Q. alba. *Haw.* Q. nivea? *Haw.* Parkinson says, "glistening whitish grey, cup yellow; peradventure but a difference of seed from the former." The limb of this variety is not really white, but has a dull yellowish tinge, and is inaccurately termed white by Haworth. I cannot learn that any person has seen a white variety, though he had another which he called snow-white. The orange phœnix is the double of this variety. The double narcisseæ are apt to degenerate in some seasons, or by accident, to semidouble and single, and I have seen the Butter and eggs produce a perfect single flower of Aurantia. I have seen the orange phœnix, when becoming semidouble, with the three styles quite distinct. They were parted by the process of doubling the flower, and when it became accidentally single, they were not reunited. Mr. Sabine informs me that he has twelve varieties of fœtida, but only one single one with a whitish limb. The variations which I have not enumerated are of little importance. I think the convenience of limiting the name incomparabilis to that variety to which it was affixed in the magazine, and calling the species by a more applicable generic name as stinking, will be universally admitted. Incomparabilis does not appear to be the stock from which they have all sprung; the orange rim, which it wants, seems rather the prevailing feature amongst them.

4. Orientális.—Pl. 39. f. 2. tube ⅝ths or more; limb ⅞th or one inch long; margins reflex or tortuous; cup near ½ an inch long, about ¾ wide, irregularly lobed and 3-cleft. N. orientalis β. Bot. Mag. 24. 948. Schisanthes. *Haw.*

Var. 2. Pl. 39. f. 2, 3.—Cup more patent and deeply gashed; leaf keeled, half an inch wide. f. 2 was made before the expansion of the flower, which was perhaps not quite full grown. A specimen from Mr. Sabine differed a little from both varieties. The second I had; the first was from the Hort. Soc. garden. The species was first united with incomparabilis in the Bot. Mag. and afterwards with an Hermione. It is, however, a perfect Queltia.

5. Odóra.—Leaves deep green; perianth uniform bright

yellow; tube slender, about ¾ of an inch long; limb about an inch long; cup about half an inch long, ½ or ¾ wide; style ¼ of an inch shorter than the cup. Ovules usually in three rows, full, but irregular.

Var. 1. Campernelliána.—Philogyne Campernelli. Haw. The finest variety; scape often 4-flowered; flowers equal to, if not exceeding, the var. called N. calathinus, Bot. Mag. and rather more brilliant in colour.

Var. 2. Caláthina.—Pl. 39. f. 8. N. calathinus. Bot. Mag. 24. 934. Linn. S .ed. 2. et MS. in marg. ed. 1. quoad auctor. cit. non quoad descriptionem. N. odorus Linn. herb.

Linnæus's specimen of N. odorus is from the Upsal garden, a two-flowered specimen of a plant of this species, with a six-lobed cup, the tube and limb together measuring barely one inch and ⅝, the limb exceeding the cup ⅜. This is ⅜ shorter than calathina of the Bot. Mag. and comes nearer to v. læta; but as I have adopted Linnæus's name odora for the whole species, it is needless to discuss the difficult point, which variety lies dried in his herbarium. He never had a specimen of N. calathina, but named it, in MS. on the margin of the first edition, and published it in the second with a reference to Clusius, No. 1. juncif. 9. and Rudb. El. 2. p 60. f. 5. Rudbeck's figure is a very unfaithful copy of that of Clusius with a reference to it; therefore the original plant of Clusius is the thing meant, and that corresponds very closely with N. calathinus Bot. Mag. Rudbeck exaggerated the size of the cup in his engraving, on the faith of which Linnæus described it as having the cup and limb nearly equal, but no such specimen has ever been forthcoming: and, as Linnæus had no specimen, but meant to describe the plant of Clusius, we must look to Clusius alone, rejecting the garbled figure of Rudbeck. Our calathinus seems a little more indented than the flower of Clusius, but there is no other difference. M. Decandolle, in Red. lil., in consequence of Linnæus's statement that the cup and limb were equal, applied the name to a plant with a reflex limb; but the reference to Clusius's figure, and even Rudbeck's, as well as Linnæus's reference to Tazetta, shews that it was not a reflex flower. His odorus was probably a variety a little different from any of those we have now in cultivation. Nothing can better shew the unsettled state of Linnæus's mind concerning the Narcissi, than his specimen of N. tenuior first marked by him trilobus, which name he afterwards erased and substituted Tazetta!

Var. 3. Caláthina minor.—Pl. 39. f. 9. Flower considerably smaller, but similar in its proportions.

Var. 4. Rugulósa. Haw.—Pl. 39. f. 11. Leaf rounded, and not keeled on the back, strongly nerved, more concave than heminalis; segments wider and more patent; cup more distinctly lobed. Flowers three or less. Tube ¾, cup about ½, limb nearly one inch; sepals 11-16ths, petals 9-16ths wide.

Var. 5. Interjécta. Haw.—Pl. 39. f. 10. Leaf like rugulosa; lobes of the cup more curled; tube ¾, cup about ½, limb about an inch long; sepals ⅝, petals half an inch wider.

Var. 6. Heminális. Haw.—Pl. 39. f. 12. Leaf ¼ of an inch wide, keeled, strongly nerved on the back, flat with upstanding margins in front; scape roundly two-edged; tube about 11-16ths, slender at the bottom, much enlarged upwards; limb near an inch long, cup ½ or more, plaited, irregularly and not deeply six-lobed; perianth of a deeper yellow than any other variety; very fragrant.

Subvar. Heminális, minor.—Similar in all parts, but smaller; leaf not 3-16ths wide.

Var. 7. Tríloba.—Pl. 39. f. 13. Leaf as in rugulosa; tube ¾, cup ½, or more, slightly three-lobed; sepals 9-16ths, petals 5-16ths wide.

Subvar. Læta. Curtisii. Haw.—Pl. 39. f. 14. Rather smaller than the last, and less conspicuous, and only distinguishable as an inferior variety.

No reasonable person, after comparing the exact representations of these flowers in plate 39 of this work, will differ from me in considering them to be varieties of one species.

6. Juncifolia.—Pl. 43. f. 1. Requien. Spec. herb. Bentham. I find three varieties of this little plant in Mr. Bentham's herbarium. Leaves very narrow, 1-3 flowered, flower bright yellow, limb about

twice the length of the cup, of which the margin is undulated and indistinctly lobed.

Var. 1. From Restinctières near Montpelier, in dry stony places. Scape about 7 inches high; leaf scarce 1-16th wide. The Castilian rupicola of Schultes is probably this plant.

Var. 2. Scape only four inches. Pont du Gord.

Var. 3. Tallest; leaves about 13 inches long and wider. Capouladoux near Montpelier.

7. Pusilla.—Pl. 43. f. 2. Specim. Masson. Herb. Banks. ex Hispaniâ inter Ayamonte et Huelba. Foliis filiformibus subbiuncialibus scapo gracillimo $2\frac{1}{2}$ unciali bifloro, spathâ unciali pedunculis longiore, tubo subcylindrico semunciali luteo inferne virescente, limbo $\frac{3}{16}$ unc. luteo (coronâ luteâ erosâ? vel sex lobatâ?)

This most singular diminutive species was found by Masson between Ayamonte and Huelba in Spain, and I cannot find that it has been noticed by any other person, unless the obscure plant which has been named jonquillioides, from a mutilated one-flowered specimen in the herbarium of Willdenow, from Portugal, be referable to this, but there is nothing in the imperfect description of it, but the filiform leaf to identify them. My outline gives the exact dimensions of the plant.

8. Jonquílla.—Pl. 39. f. 15. before expansion. Bot. Mag. 1. 15. Leaves narrow and rounded, channelled on the surface. Tube $1\frac{1}{8}$, slender, limb about $\frac{5}{8}$ths of an inch long, cup $\frac{1}{8}$th or more. Flower all yellow, very fragrant.

This plant differs from the foregoing species of Queltia in having shorter anthers, nor am I satisfied that their structure is precisely similar. Its seed differs a little from any seed of Narcisseæ that I have seen. Not having been able to obtain the ripe fruit of the Queltias, I cannot come at present to a decisive opinion whether the jonquill is a species of Queltia or a genus by itself. Its capsule is erect and not sloped as those of Queltia appear to be, yet it does by no means agree with Hermione, to which Sweet referred it.

It flowers later than any Queltia, and has much affinity to the autumnal species of Narcisseæ, which I have no opportunity of examining in a fresh state. In all of them the capsule is erect, and the tube very slender, from 6 to 8 times as long as the cup. I cannot ascertain whether their anthers conform with those of the jonquill.

Var. 1. Major, var. 2. Média, var. 3. Minor, are cultivated at the Chelsea garden. I believe the difference to be very little. I could observe none in the stature of the plants after the flower was faded. Haworth adds a fourth and smaller variety, which he calls parvicoróna, but I find no trace of it. Haworth's definitions of his genera Schisanthes, Jonquilla, and Chloraster, are merely inadequate descriptions of three species. His genus Tros is a specific description of Queltia montana, with galanthifolia, which is perhaps a variety of montana; his Schisanthes of Queltia orientalis, his Philogyne of odora and its varieties.

9 ? Púmila.—Pl. 41. f. 26. N. pumilus, Red. lil. 7. 409. Leaves very slender, scape slender short, flower all white, cup about ⅓ the length of the limb, crenate. Native situation not ascertained. Only known by the figure and description in Redouté. I believe it to be a true Queltia.

78. NARCISSUS.—Style straight, slender; filaments straight, free at the point only, the sepaline adnate to the mouth of the tube, the petaline just below; anthers short, with the summit recurved, the margins not meeting behind. Tube slender, cylindrical, widened at the mouth; cup short, spread. Capsule declined? and seeds, as far as I have seen, roundish-oblong, unless angular by contact, wrinkled, with a slender raphe and prominent chalaza.

1. Grácilis.—Leaves green, narrow; spathe 1-3-flowered, slender; perianth pale yellow; style equal to the tube, seeds less round than those of poeticus.

Var. 1. Prínceps.—Pl. 41. f. 4. Bot. Reg. 816. Sweet Br. fl. g. ser. 2. v. 2. Tube 1⅛, limb near one inch long, cup darker, crenulate, 3-16ths long.

Var. 2. Planicoróna.—Pl. 41. f. 3. Leaves narrower; tube ⅞, limb about ½ an inch; cup about 3-16ths long, yellow, margin even.

Var. 3. Tenúior.—Pl. 41. f. 3. Bot. Mag. 11. 379. Tube ⅞, limb 11-16ths, pale yellow, fading nearly white; cup yellow, 3-16ths, margin waved.

2. Biflórus.—Leaves a little glaucous; 1-4-flowered; limb creamy white, cup yellow; seeds not seen by me.

Var. 1. Stérilis.—Biflorus. Bot. Mag. 6. 197. 2-flowered, without pollen or ovules in our gardens, perhaps from having been raised by offsets three centuries or more, without renovation by seed. I see no reason to think it a hybrid production, for it does not exhibit appearances intermediate between those of any two narcissean genera, or even species.

Var. 2. Triflórus. —2-4-flowered, from the south of France; ovules perfect, flower rather smaller and the white clearer.

Var. 3. Diánthus.—Haworth. Unknown to me, but described as 2-flowered, with a very plicate and darker yellow or orange cup.

3. Poéticus.—Linnæus. Leaves glaucous; flowers solitary, rarely, if ever, 2; limb pure white, unless a small yellow mark at the base of the segments; cup yellow, margined with red or deep orange. Seeds rounder than those of Gracilis.

Early flowering.—April.

Var. 1. Grandiflórus.—Sabine MS. Poetárum. Haworth, absque causâ nomen Linnæanum (*poëticus)* repudians. Stamen and anther, pl. 38. f. 3. magnified. The largest and most conspicuous, but there is no reason for thinking that this variety was particularly alluded to by the ancient poets.

Var. 2. Angustifólius.—Pl. 41. f. 1. before expansion. —Bot. Mag. 5. 193. Leaves narrow; flowers smaller than v. 1.

Var. 3? Ornátus.—The flat-crowned saffron rim. *Haworth.* A doubtful variety, which I have never seen. It is described by Haworth, as an early variety, similar in appearance with the late flowering patellaris; he cites as synonymus to his Ornatus, tripodális, MS Salisbury, tripedalis, Schultes. I am not acquainted with this earlier variety.

Var. 4. Spathulátus.—The lesser saffron rim. Haworth.

Smaller and earlier than v. 8, but in other respects similar; margin of the cup plicate.

Var. 5? Albus.—The slightly saffron rimmed. Haworth. Flowers in the middle of April. I have no knowledge of the last three varieties, and I cannot find them in cultivation at present.

Late flowering.—May.

Var. 6.—Majális.—Pl. 40. f. 2. Engl. Bot. 4. 275. Anther Pl. 38. f. 14.

Var. 7.—Recúrvus.—Pl. 40. f. 1. Sweet Br. fl. g. ser. 2. Leaves with the points always drooping; limb waved, reflex.

Var. 8. Patellâris.—Pl. 40. f. 3. Leaves broad, sepals more reflex than the petals, whence either this or the earlier ornatus was called tripodális, corrupted into tripedális, implying that the three reflex segments represent the feet of a tripod.

Var. 9. Stelláris.—Haworth. Park. Parad. t. 76. 4. Sweet Br. fl. g. ser. 2. 132.—Wild specimen, dep. d'Aveyron. Herb. Bentham. Segments of the limb narrow at the base and distinct. Cultivated in the Chelsea garden, and by the Hort. Soc.

Diminutive.—May.

Var. 10. Verbanénsis.—Pl. 37. f. 2. A very diminutive plant, agreeing with Poeticus, but smaller in all its parts, with very narow linear leaves, and reflex limb, tinged with yellow at the base. Brought to Bolton Percy in Yorkshire a few years ago, by Mrs. Robert Markham, who found it growing in a pasture, about a mile from Baveno, near Lago Maggiore, on the side of the road to Milan. It is remarkable that this plant does not seem to increase by offsets in its native situation, the bulbs being found single and scattered about the pasture, instead of growing in tufts, like most others. It flowers about the middle of May both there and in England. Parkinson has two small varieties, one with a purple rim, from France, which Haworth calls purpuro-cinctus; another from the Pyrenees, with an orange rim, which he calls croceo-cinctus. They must be nearly allied to this plant; and perhaps they might be separated without impropriety from poeticus, under the name exiguus.

The seeds of Gracilis, v. princeps and tenuior, are less round than those which I have seen of Poeticus, namely, recurvus and stellaris, and, as I can judge by comparison of the ovules, grandiflorus, angustifolius, majalis, and patellaris. I did not inspect the ovules of Verbanensis, and although it has ripened seeds at Bolton Percy, they had been mislaid, and I have seen none. Judging from the insufficient view I have been able to obtain of the seeds of some of the Narcisseæ, and the ovules of others, I believe it will be found that each genus embraces a certain range of outward appearances in the seed, and that the differences of the seed will establish clearer limits to the species. There is a like diversity of seed in Gladiolus, by which I can perceive in the produce of crossbred plants of that genus, even the most remote affinity to G. tristis. To ascertain exactly what diversity in the outward appearance of seeds is compatible with generic identity is a point which requires to be deeply investigated, and we must look to hybridizing experiments, as the test which must establish the accuracy of any surmises on that subject.

Haworth's genus Helene is a specific description of the pale yellow Narcissus gracilis, with its varieties tenuior and planicorona, with which he absurdly unites the small varieties of Narcissus poeticus, such as Verbanensis, which may possibly be separable as a species, but which it is preposterous to refer with gracilis to another genus, because their leaves are narrow; he further adds to them, pumilus of Redouté, which I have never seen, but which, in the absence of more accurate knowledge, seems to me, knowing nothing of the structure of its stamens, referable to Queltia.

79. Hermíone.—Style straight, slender; filaments conniving, with a short curved point, alternately inserted; the sepaline at the mouth of the tube, decurrent, scarcely partible from it, attached to the middle of the anthers; anthers after inversion acute-oval, incumbent, versatile. (Capsule erect; tube slender, cylindrical, enlarged at the mouth; cup shorter than the tube or limb.) *Observ.* I had found seeds of Hermione to be smooth, shining, compressed, with rounded back, an-

gular by contact, with prominent margins edged by a furrow; raphe sulcate, with prominent margins; chalaza inconspicuous; but I have seen a departure from that outward form in seed of another Hermione, shewing that those of the whole genus and suborder require careful examination to ascertain the range of differences that is admitted, by which perhaps the several species may be limited. It should be carefully observed whether such variations, as shall be found to occur, may in any manner correspond with greater or less repletion of the fistular cavity of the scape, which is remarkable in different species or varieties of Ajax and Hermione.

1. Bífrons.—Leaves deep glossy green; perianth yellow; cup more or less 6-lobed, shallow, patent; style just exceeding.

Var. 1. Princeps.—N. bifrons. Bot. Mag. 29. 1186. With me the tube $\frac{7}{8}$ths, the limb near $\frac{3}{4}$ths, cup 3-16ths. Mr. Ker imagined that the primuline variety imported from Holland, degenerated into the form of this variety, after some years of neglected culture. This appears to be a mistake, for the fact was positively denied by Mr. Salisbury after many years experience. The segments of the limb are three times as long as the cup, not lapping.

Var. 2. Primúlina.—Bot. Mag. 32. 1299. 4-flowered or under; cup 6-lobed, wider; limb three or four times as long as the cup. *Haworth.* Tube 6-8ths, limb near 5-8ths, cup almost flat, 6-lobed; style 1-16th of an inch exceeding the anthers.

Var. 3. Compréssa.—2-6-flowered, cup more erect, crenate, rather cleft into three lobes. Haworth. I apprehend N. tripartitus, Hormem. to be this plant. In the specimens of this variety received from Mr. Sabine, and from Mr. Ellacombe, I find the tube $\frac{7}{8}$ths, the limb broad, above $\frac{5}{8}$ths long, the cup flat, 6-lobed, the style just exceeding the anthers. I believe Haworth's description of the cup as erect, to be an error.

Var. 4? Biscrenata.—Haworth. Unknown to me, but associated with these varieties by Haworth, who states it to exceed in stature with 6-9 flowers, the cup almost 12-lobed, the six lobes being severally indented; the limb broad ovate, more than twice as long as the cup. I can have no certainty from Mr. Haworth's insufficient details, whether the plant he meant to describe belongs to this species. He does not notice the style, and it might have been a variety of H. brevístyla allied to v. 10. represented pl. 41. f. 10; but I have just received biscrenata from Mr. Penny, nurseryman, at Godalmin, and am satisfied by the aspect of the bulb and leaves that it is a variety of bifrons.

2. Tazétta.—Stigma between the upper anthers; cup yellow or orange; limb white, pale lemon, or yellow. *Observ.* The tube is usually from ½ an inch to ⅞ths long, and the limb seems to have precisely the same latitude of variation; the tube is oftener longer than the limb, sometimes equal, more rarely shorter. If it were ascertained that the varieties in which the limb equals, and in which it exceeds the tube were found so wild invariably in certain localities, and that the proportions did not vary in cultivated seedlings, it might be advisable to separate them on that account, and increase the number of specific names; but I can find no account of those varieties in a wild state, and we have no report of the variabilities of Hermione in cultivation. It is utterly impossible to identify Mr. Haworth's named varieties, for he has not noticed the style, and his definitions do not enable me to class them. I do not pretend to detail the multitude of varieties which are to be found in cultivation, but I have given the outline and particulars of all those to which I had access last year, which will be quite sufficient to shew in what manner the genus varies, and enable any person to arrange the further varieties under the proper heads, till their seeds and their seminal variability can be more fully investigated.

Tube equal to the limb.

Var. 1. Cupuláris.—Limb yellow, cup orange. Salisb. H. Tr. 1. 361. N. Tazetta. Bot. Mag. 23. 925. Red. Lil. 1. 17. Tenore 1. 148. N. flavus. Lagasca N. G. et s. 13. Soleil d'or hortulanorum. With me it has the tube and limb about $\frac{3}{4}$ths, the cup about $\frac{1}{4}$th long, orange. Linnæus, not having seen the variability of the length of the cup and limb, defined Tazetta as having the limb three times the length of the cup. It is true with respect to this plant, but that proportion does not appear to afford any safe distinction. Native of Portugal, Spain, Italy, Greece, Malta, and the coast of Africa. Tenore specifies the mountains near Miseno and Capri.

Var. 2. Pl. 41. f. 15. flower a little shorter.

Var. 3. Pl. 41. f. 20. Limb pale lemon, cup deep yellow, about $\frac{1}{4}$ long, tube and limb half an inch each.

Var. 4. Pl. 41. f. 18. Limb white, cup pale yellow, tube and limb 9-16ths of an inch each. N. Tazetta from the garden of the Hort. Soc.

Var. 5. Pl. 41. f. 21. Very pale sulphur, yellow at the base, cup bright yellow, 5-16ths, limb and tube $\frac{5}{8}$ths of an inch long. This comes near the Greek mountain plant Flor. Græc. t. 388.

Tube shorter than the limb.

Var. 6. Longilímba.—Pl. 41. f. 22. Very shewy; limb bright yellow, broad, $\frac{7}{8}$ths long; tube $\frac{5}{8}$ths, cup near $\frac{3}{8}$ths, long, crenate.

Tube longer than the limb.

Var. 7. Pl. 41. f. 17. Limb white, shorter than the tube, cup bright yellow; limb about $\frac{3}{4}$ths long.

Var. 8. Pl. 41. f. 19. Czar Monarque? hortulanorum. Limb white, yellow at the base of the segments, near $\frac{5}{8}$ths long, tube $\frac{7}{8}$ths, cup subcylindrical, $\frac{3}{8}$ths long.

Var. 9. Pl. 41. f. 16. Imported from China; tube about $\frac{3}{4}$ths long, limb white shorter, cup pale yellow.

Var. 10. Sexlobáta. Pl. 41. f. 23. N. orientalis γ? Bot. Mag. 24. 946. Segments broad roundish, pale lemon-colour fading to white; cup patent, 6-lobed; tube $\frac{7}{8}$ths long. A very beautiful and hardy variety.

Var. 11. Lactícolor.—Haworth. N. Tazetta Flor. Græc.

358. Limb sulphur-coloured, cup orange, tube above $\frac{7}{8}$ths long.

3. Papyrácea.—Bot. Mag. 24. 947. N. unicolor. Tenore. Fl. N. 1. 26. Perianth pure white, cup short, stigma between the upper filaments. Bulb blacker; flowers 8-15. (Cup five times shorter than the limb?) Grows near Mount Vesuvius. Only distinguishable from Tazetta by the white cup, darker-coated bulb, and peculiar scent.

4. Dúbia.—Red. Lil. 8. 428. Leaves narrow; perianth all white; style shorter than all the stamens; bulb small. Flowers 2-3 when wild, 6 when cultivated.

Var. 1. Pl. 43. f. 6. Two-flowered, 7 inches high; leaf little more than 1-16th wide. Avignon. Herb. Bentham.

Var. 2. Pl. 43. f. 7. Three-flowered, tube slenderer; leaf similar to var. 1. Restinctieres, near Montpelier. Herb. Bentham. Flowers in March.

Var. 3. Pl. 43. f. 8. Tube shorter and thicker, leaf 3-16ths wide, 8 inches long. Near Montpelier, Herb. Bentham.

5. Corcyrénsis.—Pl. 37. f. 2. Leaves half an inch wide, glaucous; scape 1-flowered (Qu. whether ever more?) 6-7 inches; spathe 1-valved, looped; limb $\frac{3}{4}$ths of an inch long; cup yellow, scarce $\frac{1}{4}$th, trifid; limb near $\frac{3}{4}$ths, reflex, segments narrow, acute, pale sulphur-colour; peduncle above an inch; style shorter than the stamens. I have had this remarkable plant, which was found growing wild in Corfu, near thirty years. It is hardy, the points of the leaves being, however, injured by the winter, and it flowers at the beginning of April, or sooner in forward seasons. I have never known it produce more than one flower on a scape, though I cannot say that in a more congenial situation it might not do so; but on the other hand I have never seen any vernal Hermione produce a solitary flower. Its small stature, one-flowered habit or at least propensity, slender reflex limb, and deeply trifid cup, seem to distinguish it as a species from

Brevístyla, with which both it and Dubia agree as to the style. It is not allied to Queltia orientalis, notwithstanding the trifid cup of both plants.

6. Brevístyla.—Style shorter than the stamens, about half the length of the tube, or a little more; limb white, pale lemon, or yellow; cup yellow or orange.

Tube equal to the limb.

Var. 1. Pl. 41. f. 9. Limb pale yellow, cup deeper; limb much less than var. 5; tube and limb about $\frac{5}{8}$ths each. Flowers early.

Var. 2. Large yellow, pale yellow cup; tube and limb about $\frac{3}{4}$ths each.

Var. 3. Pl. 41. f. 12. Limb creamy white, cup yellow; tube and limb about $\frac{3}{4}$ths.

Var. 4. Crenuláta.—Haworth. Bazelman minor of the gardeners. Tube and limb each $\frac{7}{8}$ths of an inch long; limb white; cup wide, yellow, edged with orange.

Tube shorter than the limb.

Var. 5. Pl. 41. f. 7. Limb pale yellow, cup deeper, limb large, near $\frac{7}{8}$ths long, tube not $\frac{5}{8}$ths.

Var. 6. Cítrina major.—Pl. 41. f. 8. Grand citronier. Sweet Br. f. g. ser. 2. 128. Limb white, broad, about an inch long; tube thick $\frac{3}{4}$ths; cup pale yellow; flowers numerous.

Var. 7. Trewiána.—N. orientalis α. Bot. Mag. Bazelman major of the gardeners. Flowers large, limb white, cup wide crenulated.

Var. 8. Flexiflóra.—Haworth. Tube $\frac{7}{8}$ths long; limb white, near an inch long; cup 5-16ths wide or more. This and the foregoing are coupled with crenulata by Haworth as Grandifloræ, and he fancied them a separate genus; but in fact the flower of Citrina major is larger.

Tube longer than the limb.

Var. 9. Pl. 41. f. 6. Limb creamy white with yellow marks at the base of the limb; cup deep yellow; tube $\frac{7}{8}$ths, limb half an inch, ovate, acute.

Var. 10. Pl. 41. f. 10. Fine yellow, cup deeper; tube $\frac{3}{4}$ths, limb not $\frac{5}{8}$ths.

Var. 11. Pl. 41. f. 11. Limb yellowish white, about half an inch; cup orange; tube $\frac{7}{8}$ths.

Var. 12. Pl. 41. f. 13. Limb yellow, about $\frac{5}{8}$ths; tube $\frac{3}{4}$ths; cup deeper yellow. Jonquil-scented.

Var. 13. Pl. 41. f. 14. Yellow, cup deeper yellow; cup much larger than var. 12. Jonquil-scented.

Var. 14. Pl. 41. f. 5. Limb white, $\frac{5}{8}$ths; cup lemon-coloured; tube $\frac{7}{8}$ths.

6. Itálica.—Style nearly equalling the cup; cup yellow; limb white or pale yellow.

Var. 1. Prínceps.—Bot. Mag. 30. 1188. About 10-flowered; limb very pale sulphureous, four times as long as the cup; cup irregularly cleft, pale yellow.

Var. 2. Prǽcox.—Tenore, Flor. N. 1. 27. Pale sulphur, cup citron, 6-cleft.

Var. 3. Pl. 41. f. 24. Limb white, cup 3-cleft, yellow; tube near $\frac{3}{4}$ths long; flower approaching to Papyracea in scent. A hardy, late-flowering variety.

Var. 4. Brévis.—Pl. 41. f. 25. Limb white, cup wide, yellow irregularly cleft; tube half an inch long.

§. 2. *Autumnales.—Flowering in the autumn.*

Not having had an opportunity of inspecting the stamens and fruit, I cannot be sure that this section may not form a genus intermediate between Hermione and Narcissus. The proportions in this section approach more to those of Narcissus. Serótina has the capsúle erect.

1. E'legans.—Pl. 41. f. 27. See Hermione elegans. *Supplemental Observations.* Tube near $\frac{3}{4}$ths long; limb acute $\frac{5}{8}$ths or a little more. N. serotinus; fig. 7-flora. Desf. Flor. Atl. 1. 283. t. 82. This African plant is confounded by Desfontaines with the 1-2-flowered serotina of the south of Europe. I have given the outline of a flower copied from the umbel represented by him, and also his outline of serotina, Pl. 41. f. 30. which last I have verified by comparison with dry specimens to be perfectly correct. It will be seen that the difference is very considerable in the form of the flower, that of elegans being

much longer and more acute; and as serotina occupies a very wide range in Spain, Sardinia, Naples, and Africa, with a one- (rarely two-) flowered scape, without varying its form of flower, I think the many-flowered plant of Desfontaines requires to be distinguished. Both are remarkable for the erect posture of the flowers. According to Zerapha (Flor. Melit. thes.) this many-flowered plant, with lanceolate segments, and a very short entire crenulate cup, grows in the island of Malta, where it is called Rangís mewahhar. N. obliteratus Willd. Reliq. Schultes is probably this plant.

2. Serótina.—Pl. 41. f. 39. and 36. Tube near half an inch, limb broader than in elegans, about 7-16ths long. The former represents the tube, cup, and sepal, from G. Bentham, Esq.'s Sardinian specimens; tube more or less enlarged in different specimens; the latter Desfontaines's outline of the African specimens, verified by comparison with the Sardinian. Scape 1-2-flowered; tube 9-16ths, limb 7-16ths, white, cup 1-16th, yellow; flower erect; flowering usually before the appearance of the leaves. Found in Spain, near Badajos, in Sardinia, Naples, and North Africa. A miserable engraving of this plant by Clusius was evidently copied and grossly exaggerated by Parkinson, who does not on this occasion deserve the name of faithful, given to him by Haworth, having set leaves or bractes on the scape. Miller described the stalk of serotina to be knotted; Tenore has given a like description, and authors have been deceived into a belief that the plant has an articulate scape, quite repugnant to the character of the suborder. Desfontaines takes no notice of this supposed phenomenon, and represents the scape like that of other Amaryllidean plants. On examination of many specimens, it appears that the knots exist in a very small proportion of them, quite irregular in their number and position, not being articulations but swellings of the scape, and I apprehend they must have been occasioned by the deposit of the egg and larva of some very small insect. F. 30. represents three such knots on the lower part of the scape of one of the Sardinian specimens.

The coarse figure given by Clusius was intended to represent a specimen with such knots; but they are very ill represented, and the excrescences magnified by successive copyists from a bad original, have assumed a most extraordinary appearance in the figure given by Parkinson, which has no resemblance to a Narcissean plant.

I have accented the name *serótina* (late-flowering) on the o, in conformity with the authority of Hilary of Arles, who has the i short. I should have considered that the analogy of the words vespertínus and matutínus, also expressing time, would have overborne his authority; if Prudentius,* who has much weight with me, had not used another adjective of time, diútĭnus, with the i short, and perhaps Plautus also. It is desirable to have a clear understanding as to the accentuation of the many botanical adjectives ending in *inus*. Greek adjectives in *inos* have the i generally short, though it is used both long and short in oporinos; therefore all adjectives derived from a Greek word, as caláthinus, calýcinus, crócinus, fáginus, múrinus (from muros, Gr.), must bear the accent on the antepenult, or syllable preceding the i which is short. The few adjectives in *inus* derived from the names of vegetables, of which the accentuation has been ascertained by their use in verse, as fáginus, crócinus, are, to the best of my recollection, Greek words, the original Latin practice having been to form adjectives from the names of the animals in inus, and of vegetables in *eus*. The vegetable adjectives in *inus* were of late introduction, and built upon the Greek model, even when derived from Latin names; they seem to have been always reputed short, and the contracted adjectives, abiegnus, acernus, quernus, seem to imply the brevity of abietinus, acerinus, and quercinus, which were not used. Pliny seems to have attached to the termination *inus* a peculiar meaning, as virga myrtea or laurea, a myrtle or laurel twig; oleum myrtinum, laurinum, myrrhinum, oil extracted from myrtle, laurel, or myrrh; folium laurinum, a leaf like that of laurel. Adjectives in *inus*, from the names of animals, are invariably long and accented on the i; as equínus, canínus, cervínus, viperínus, aquilínus, murínus, from mus. I think it may be laid down as a general law that all adjectives in *inus*, of Greek extraction, or derived from the names of vegetables (such being framed on the Greek model), have the i short and unaccented; all derived from the names of animals, and generally all other adjectives in *inus*, the i long and accented, unless there be special authority to the contrary; and I call to mind no other exceptions than serótinus and diútinus, though it is very possible that others may escape my recollection.

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* The deviations of Prudentius from the quantity of such Greek words as eídōla, which he wrote ídŏla, did not arise from ignorance or false pronunciation, but because the Greek word had the o long, but the accent nevertheless on the first syllable, which was contrary to the law of Latin pronunciation; and, as it was necessary, in order to reconcile it, to depart either from the accent or the quantity of the original word, he sacrificed the latter as the least deviation from the original sound. There had been a gradually increasing preference for accentual sounds, which (as I pointed out many years ago in an article on the harmony of language in the Edinb. Rev. v. 6) at first limited the temporal metres of the Romans, and at last superseded them, by the establishment of the accentual cadences which regulate the verse of modern Europe. In the days of Virgil the quantity of the syllables was deemed more important than the accent, and we learn from a note by Pierius (Georgic. i. 59.) that when Virgil introduced the Greek word E'piros, his meaning, in preserving the Greek termination *os*, was to preserve the Greek accentuation on the first syllable, though the i in the second was long; whereas if he had written the word with Latin orthography Epirus, the rule of Latin pronunciation would have thrown the accent on the i. Such a departure from the Roman habits of speech could not be generally adopted, and we find in the words introduced from the Greek at that period, the accent was changed rather than the quantity; in a later age the quantity was sacrificed to preserve the accentuation.

3. Obsoléta.—*Haw.* N. autumnalis medio obsoletus. Park. Par. p. 90. t. 89. f. 4. Two flowers declined, white; cup very small; yellow, with dun-coloured edge; leaves two, narrow; scape rising between them. Received by Parkinson from Spain, and not since noticed. N. Broussoneti *(Lagasca)*, colour unknown, is perhaps this plant. Pl. 41. f. 28. represents the tube, cup, and sepal, of two-flowered specimens from Tangiers (herbar. Bentham. and Lindl.), the flowers of which have the posture of those of Viridiflora; the cup minute, the tube a little exceeding half an inch; segments of the limb obovate, equal to the limb; but the colour of the flowers cannot be ascertained. If they are not viridiflora, they are probably obsoleta. The obovate apiculate sepal seems to distinguish them from the others.

4. Viridiflóra.—1- (3?) flora. Bot. Mag. 41. 1687.

Flower green, jonquil-scented, cup very small, 6-lobed; scape produced before the leaves; tube according to the figure $\frac{5}{8}$ths, limb nearly as long, leaves rush-like; bulb small. The specimen there represented is one-flowered. (Specim. ex Tangiers? Pl. 41. f. 28. Herb. Benth. et Lindl. 2-flor.) This plant grows on the neutral ground between Gibraltar and St. Roque, and on the coast of Barbary. I believe the two-flowered specimens from Tangiers to be viridiflora. Parkinson's green-flowering plant, of which the cup according to the figure was not lobed, had a three-flowered scape.

Var. 2? Integra?—Park. Par. 94. 11. t. 93. f. 6. 3-flowered, cup entire. The existence of this variety with an entire margin to the cup, depends on the accuracy of Parkinson's figure; and, as he does not state the margin to be entire, I consider the figure to deserve very little credit.

This species forms the genus Chloraster of Haworth; his generic character is a very incomplete description of the species, and contains no semblance of a generic distinction. I have lost the plant many years, and have had no opportunity of examining the most important features of this and the other autumnal species.

Suborder 6.—Galanthéæ. Porandrous; i. e. not having the anthers slit and inverted, but opening partially; in this instance the pollen is discharged through two small round holes at the summit. Not operculous; bedded, i. e. with a glandular spongy covering to the germen, in which the filaments are inserted. *Pollen not half the size of the smallest pollen of Amaryllideæ; peduncle curved.*

This suborder is confined to the portion of the old Continent north of the tropics.

§. 1. *Scape solid; seeds whitish.*

80. Galanthus.—Bulb ovate; leaves linear lorate; scape 1-flowered; spathe tubular below; above, slit on one side, transparent on the other; germen oblong-ovate, pendulous; segments separate; sepals concave, expanding in the sun; petals much shorter, obovate, emarginate, 2-lobed, having the semblance of large nectareous scales; style filiform, tapering to a

point; filaments short, equal, inserted in the opercle, free; anthers erect, affixed at the base, apiculate; orifices terminal, round; capsule valveless; seeds whitish; pollen very minute.

1. Nivális.—Engl. bot. 1. 19. Sepals white; petals with 5 green lines down the inside of each lobe, and an undulated green mark towards the top outside.

Var. *hortensis*, flore semipléno. The doubleness of this flower consists in a multiplication of the scale-like petals, on some of which an anther more or less perfect is usually borne; which is very usual also in Camellia Japonica. Dr. Lindley considers this analagous to the production of supernumerary anthers in Gethyllis, which occurs also in Vellosia. It appears to be the necessary result of the imperfect conversion of the stamens into petals, the flower being in fact only semi-double. The like occurs in the semi-double Hippeastrum equestre. In Gethyllis and Vellosia the stamens are multiplied without any multiplication of the segments.

2. Plicátus.—Bot. Reg. 7. 545. Bot. Mag. 47. 2162. Marsh v. Bieberstein. Fl. Cauc. Sup. 225. Leucojum bulb. præc. Byz. Clus. Hist. 1. 169. Bulb larger; leaves larger, with their margins folded back; scape more robust; flower smaller, green, more intense; petals set more in than the sepals, and having more the appearance of a scale. The sepals are a continuation of the outer coat of the germen, but in plicatum the petals are set on its inner coat, and their base does not range with the sepals. If the petals of Nivalis had agreed with it in that respect, I should have thought that the true petals were entirely deficient. It is a native of Russia and Asia.

81. Erinósma.—Bulb ovate; leaves linear lorate; scape 1-2-flowered, pedunculated; germen triangular, obovate, pendulous; spathe tubular below, above slit on one side, transparent on the other; germen obovate, segments of the perianth separate, similar; filaments short, equal, free, erect, inserted in the opercle; anthers erect, affixed at the base, not apiculate;

orifices terminal, and style club-shaped (i. e. thick at top, attenuated downwards); stigma triangular, slender, tapering to a point; capsule turbinate, seeds yellowish white.

1. Vérnum.—Leucójum vernum. Bot. Mag. 2. 46. Spathe longer than the peduncle, perianth ¾ long, segments concave, oval, with a blunt point; a yellowish green spot on the outside of each, just below the point; style white below, green upwards; the tapering point white. Flower fragrant; in February.

This is no Leucojum, for that genus has shining testaceous black seeds like those of Hemerocallis, and a style attenuated at both ends like the roller used by pastry-cooks. It differs from Galanthus in having the petals like the sepals, and the style club-shaped and thick, instead of slender and tapering upwards; it differs from Acis in the complete separation of the segments of the perianth, which are united in Acis, in the style attenuated downwards instead of upwards, the acute stigma, and the round orifices of the anthers, which if we may trust the usual accuracy of Parad. Lond. are more longitudinal in Acis (see Par. Lond. fig. 21.) and the leaves not being filiform. Erinosma should be planted in peat. In very wet summers it may be advisable to take up the bulbs.

2. Carpáthicum.—Leucojum vernum; var. β. Bot. Mag. 45. 1993. Spathe 2-flowered; spots on the perianth yellow.

I have not been able to obtain a sight of this plant. I see no reason for confounding it with the one-flowered, green-spotted vernum. I believe that vernum does not ever produce a two-flowered scape, and that the L. præcox majus of Clusius is Carpathicum.

82. Acis.—Perianth just united at the base; segments nearly similar; filaments inserted in the disk; free, short, straight; anthers erect, affixed at the base; dehiscent on the outer side near the orifice; style filiform, a little attenuated upwards; stigma a little divided; seeds fleshy, angular. (Bulb ovate; leaves filiform; scape 1-few-flowered; spathe 2-valved; germen pendulous.)

1. Trichophýlla.—Leucojum trichophyllum. Bot. Reg. 7. 544. One-flowered, perianth oval, white; flowers vernal.

2. Grandiflóra.—Pl. 30. fig. 4. Specim. Herb. Linn. Leucojum Redouté lil. 217. 2-4-flowered, perianth oval, white.
3. Rósea.—Sweet Br. fl. g. 297. One-flowered, perianth oval, pink; leaves glaucescent.
4. Autumnális.—Parad. Lond. 21. Leucojum aut. Bot. Mag. 960. 2-3-flowered, perianth white, red at the base; segments 3-cleft at the end; leaves green.

The first is said to produce its blossom in the spring, the others in autumn before the leaves push. They are all natives of the countries bordering on the Mediterranean. I have had no opportunity of inspecting these myself, never having seen any but autumnalis in flower, and that many years ago. I have it in the greenhouse, where it requires to be left quite dry in summer. It grows abundantly near the river in the neighbourhood of Badajos. Rosea and autumnalis might have been united as varieties of one species under the name hiemalis, but they will probably maintain themselves distinct.

§. 2. *Scape hollow; seeds shelly, black, shining.*

83. Leucójum.—Perianth six-cleft, segments separate, nearly equal (narrowed near the point), style slender, clavate; stigma acuminate; filaments inserted in the disk; anthers erect, dehiscent on the outer side, from the terminal orifice, but not to the base; capsule soft, triangular, turbinate, 3-valved, semi-dehiscent (bulb ovate; leaves vaginating, erect, linear, lorate; scape few-many-flowered; spathe 1-leaved, deeply slit, withering; germen obovate.) Seeds nearly round, outer coat loose, foliaceous, glossy black; inner coat brown, soft, separable; albumen horny, with a large circular chalaza not visible till the coats are removed; embryo curved, reaching the foramen.

1. Æstívum.—Bot. Mag. 30. 1210. Leaves green; scape flattened, 2-edged; peduncles about an inch long or less; perianth white, with a faint green spot on each segment near the end; seeds as big as a pea. The valves of the capsule gape near the top, but adhere at the point, and do not open to the base.
2. Pulchéllum.—Parad. Lond. 74. Leaves deep green, appearing in Nov.; scape 3-7-flowered, peduncles

long, green, not crenulated; perianth white, with a green spot near the top of each segment; filaments white; style white, with a green spot below the stigma; ovules 13-20 in each cell. The figure of the style and stigma of this plant is doubtless improperly represented, for it disagrees with the description in the text, as well as with the conformation of Leucojum æstivum. I have never seen the plant.

3. Hernandeziánum.—*Cambassedes.* Leaves linear, 3-4 lines wide, obtuse, 1-1½ foot long; scape a little exceeding the leaves; spathe one-leaved, peduncle 1-1½ inch, filiform; perianth about ½ an inch (4-5 lines) long; style shorter than the limb. Differs from æstivum in having flowers about half the size, and a more oblong germen. Found by Dr. Hernandez, in Majorca, on the mountains near Lluch.

Leucojum capitulátum of R. and Schultes from Loureiro C. Ch. p. 246. is unquestionably a Curculigo or Molineria. They have been misled by the alleged thickness of the points of the limb, without considering the plicate leaves and hairy exterior of the perianth. Leucojum is remarkably distinguishable from Erinosma by the lateral slit of the anther, which is superadded to the terminal pore, sometimes running near to the base, though the anther is not at all inverted, as in the schistandrous genera; the stigma is much like that of Erinosma, but the style slenderer and less clavate.

Suborder 7? TACCÉÆ.

Concerning these anomalous plants, which form the order Taccaceæ, and in my opinion do not properly belong to Amaryllidaceæ, I have little to add to what has been already stated. The order contains only the very few known species of Tacca, one of which has been detached by Prezl, under the name Ataccia. I raised many years ago Tacca pinnatifida and integrifolia from seed, and their habit was precisely that of an Arum, throwing out their fibres from the upper surface of the tuber, which lay dormant in winter. I have never seen their inflorescence, but notwithstanding its approximation to that of hexapetaloid plants, I believe they will be found to have been properly placed (p. 45) as a separate (subspadiceous subcorolliform) order. I do not recollect that any of the plants I have included under Amaryllidaceæ, produce fibres on the upper surface of a tuber; I cannot bring to mind whether the Dioscoreæ do so or not, and I have not access to any of that genus at present, but I observe from the engraving that Testudinaria does not; and, if Dioscorea does, that circumstance will furnish a stronger feature of generic distinction than any which has been yet noticed; but we must look far beyond this natural order to judge of its validity in limiting the affinity of vegetables, and we should find it distinguishing Caladium from Arum, which shews that it cannot be available as a high grade of separation.

ON CROSSES AND HYBRID INTERMIXTURES IN VEGETABLES.

The first experiments, with a view to ascertain the possibility of producing hybrid vegetables, appears to have been made in Germany, by Kolreuter, who published reports of his proceedings in the Acts of the Petersburgh Academy between 50 and 60 years ago. Lycium, digitalis, nicotiana, datura, and lobelia, were the chief plants with which he worked successfully, and as I have found nothing in his reports to the best of my recollection opposed to my own general observations, it is unnecessary to state more concerning his mules than the fact, that he was the father of such experiments. They do not seem to have been at all followed up by others, or to have attracted the attention of cultivators or botanists as they ought to have done; and nothing else material on the subject has fallen under my notice of earlier date than Mr. Knight's report of his crosses of fruit-trees, and my own of ornamental flowers, in the Transactions of the Horticultural Society of London. Those papers attracted the public notice, and appear to have excited many persons both in this country and abroad to similar experiments.

In the year 1819, having for some years previous paid attention to the production of hybrid vegetables, but ignorant of the experiments of Kolreuter, I was induced, rather against my own inclination, to address some detailed observations on the subject to the Horticultural Society, which were published in the transactions of that body. It was, I say, against my inclination, because I was fully aware, that a much longer course of experiments was necessary, in order to obtain any results sufficiently certain to give stability to my views. It is, however, satisfactory to find at the present day, after the attention of botanists and cultivators has been fully called to the subject during the space of many years, and a multitude of experiments carried on by a variety of persons, that, although our knowledge of its mysteries is still very limited, my general views have been fully verified, and my anticipations confirmed in a manner which I was scarcely sanguine enough to have expected. Soon after the publication of that communication to the Society, I was accosted by more than one botanist in the words, "I do not thank you for your mules," and other expressions of like import, under an impression that the intermixture of species which had been commenced, and was earnestly recommended to cultivators, would confuse the labours of botanists, and force them to work their way through a wilderness of uncertainty; whereas it was evident to myself, that it would on the contrary afford a test whereby the accuracy of their distinctions might be more satisfactorily investigated, many of the errors of their system eradicated, and its details established upon a more solid foundation, and less upon the judgment or caprice of individuals. The alarm, which some botanists had taken inconsiderately, appears to have subsided, and admissions have been already made by some of the most distinguished, which, if the consequences that flow from them are considered without prejudice, must lead to much more extensive avowals, and a final assent to the principle of my statements concerning specific and generic distinctions. A number of attempts had been made by the President of the Horticultural Society to produce new varieties of fruit,* by impregnating the flowers with the pollen of other individuals, and the success of his proceedings was communicated to the public, both by his letters to the Society, and by the more substantial production of the fruits he had raised; but it must be evident, that less could be expected in the raising of new fruit-bearing plants by intermixture, because the hybridising process is to a certain degree inimical to fertility in the offspring; and that the flower-garden was more likely to be adorned, than the kitchen-garden replenished, by the intermixture of species. The President adopted in his writings a principle or dogma, which seemed to be then much relied upon by botanists, that the production of a fertile cross was proof direct that the two parents were of the same species, and he assumed as a consequence, that a sterile offspring was nearly conclusive evidence that they were of different species; and this dictum was advanced without suggesting any alteration in the definition of the term species, but leaving it to imply what it had before universally signified in the language of botanists. Having, in fact, the same fundamental opinion, that the production of a fertile intermixture, designated the common origin of the parents, I held also, what experience has since in a great measure confirmed, that the production of any intermixture amongst vegetables, whether fertile or not, gave reason to suspect that the parents were descended from one common stock, and shewed that they were referable to one genus; but that there was no substantial and natural difference between what botanists had called species, and what they had termed varieties; the distinction being merely in degree, and not absolute; so that, without first reforming the terms used in botany, and ascertaining more precisely what was meant by a species, those who argued on the subject were fighting the air; and I suggested, as my view, that the birth of an intermixture afforded presumptive evidence that the parents were of one genus, meaning thereby kind or descent, and implying such an affinity as to enable them to breed together, and to induce a probability that they had diverged from one original created type. The real point in discussion at that period was, whether there did exist a positive and invariable line of fertility or sterility in all mixed vegetable productions, founded upon an original identity or diversity in the parental stocks; aud whether it was possible for two plants, which were considered according to the general system of botanists to be distinct species, to produce a fertile cross, without proving an error of the subdivision in that particular case. Further experiments have shewn, that the sterility or fertility of the offspring does not depend upon original diversity of stock; and that, if two species are to be united in a scientific arrangement on account of a fertile issue, the botanist must give up his specific distinctions generally, and entrench himself within the genera. It has been objected that if any plants, now different, had descended from one original type, we might expect to find new forms and combinations daily arising round us by the process of nature, as well as by artificial agency; whereas the catalogue of European vegetables does not appear to be increased by the production of new plants in a wild* state; but it is most probable, that if the Almighty created the original types capable of permanent variations under different circumstances, perhaps of soil or climate, those variations were worked at a very early period, on the first diffusion of seeds into every different portion of the world, especially by the operation of the flood, and may have in part resulted from the changes of climate which accompanied it and shortened the life of man. We must recollect, that although the different races of dogs, which all freely interbreed, are universally admitted to have come from one type, though now outwardly more unlike to each other than numberless distinct species of other animals, we know not what the similitude of that type was; we have no record concerning the original wild dog, nor whether there existed immediately before or after the deluge any dogs in an undomesticated state; nor have we any knowledge of the time or place when any one of the several races, as greyhound, terrier, spaniel, bull-dog, &c. took its birth; nor is there a single known instance of two parent dogs of the same race, giving birth to individuals of a new race, or materially dissimilar to themselves, except where they are mongrels, and one of the ancestral types reappears more strongly than the other. Neither have we any information concerning the origin of the different races of mankind, which are as different in appearance as the species of vegetables; we have not seen any new race arise within the period of historical certainty; and whatever we do know concerning them, refers the time of their branching out from the common stock to very remote antiquity, at a period antecedent to or coeval with the dispersion of mankind over the globe. If it had been otherwise, the various races would have been blended, instead of occupying different localities. It is probable that the various races of dogs owe their origin to a very early period; to the days, when the effects arising from change of situation, were first experienced by the several created members of the animal and vegetable kingdom: and it is no more essential to believe that individuals of every one of the present species of fox, or antelope, or finch (many of which are more like to each other than the greyhound is to the terrier, though they do not intermingle), entered with their present respective as-

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* There is a paper in the Philos. Transact. concerning the production of apples, by crossing the pollen, by Benj. Cooke.

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* Ranunculus, Anemone, Hypericum, Scleranthus, Drosera, Potentilla, Geum, Medicago, Galium, Centaurea, Stachys, Rhinanthus, Digitalis, Verbascum, Gen-

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tiana, Mentha, Quercus, Salix, and Narcissus, are however a long list of Genera enumerated by Schiede, 1825, and Lasch Linn. 1829, as having produced spontaneous hybrids, to which Crinum may be added.

pects into the ark, than that all the calceolarias on the mountains of Chili, or all the mezembryanthemums on the wastes of Southern Africa, exhibited their present peculiarities in the days of the patriarch. It was perhaps part of the wise scheme of Providence, for the purpose of peopling the world with the immense diversity of forms that occupy it, to give each created race a disposition to branch into diversities, acquiring constitutional peculiarities, which should keep them more or less separated; and the same phænomenon is observable in the languages of man, which are infinitely numerous; yet there is no reason to believe that many languages were given to man on the confusion of tongues; on the contrary, the cloven tongues that gave back the power of universal speech, imply that they were few; but from these have branched out innumerable languages, which cannot be reunited, and no person can show when or how any one of them arose, though we may trace the mingling of one with another in the later years of the world. One thing seems pretty certain, amongst the mysteries in which this subject is enveloped, that the differences worked, whether in plants or animals, in a state of domesticity, do not effect so great a constitutional separation inducing an indisposition to reunite and produce a prolific offspring, as the changes which have been wrought by nature in the wilderness.

I have said in the preliminary observations on Amaryllidaceæ, that a perfect analogy between animals and vegetables in their generations is not apparent; but I do not mean to assert, that, if this subject can ever be thoroughly bottomed, it may not be found to exist. A reformation of Zoology is in progress; for example, in Ornithology, the Linnæan genus Motacilla was after a time confined to the wagtails, a large group being detached as Silviæ; but later observers found that group to consist of several families, and have since correctly distinguished at least the robins, the redstarts, the nightingales, the hedge warblers, the fruit-eating warblers, the sedge warblers, the chats, the troglodyte wrens, and the greenish wrens, as separate genera with their respective diversities; and within those generic limits I suspect that the power of crossing may be confined, and their several species, however now immutably distinct, may have respectively branched out from one stock since the period of the deluge. I have lately had under my observation a dog, whose father was a fox in an innyard at Ripon, and it has singularly the manners as well as the voice of a fox, but it is the parent of many families of puppies: and I feel satisfied that the fox and the dog are of one origin, and suspect the wolf and jackall to be of the same; nor could I ever contemplate the black line down the back of a dun pony without entertaining a suspicion that the horse, unknown in a wild state except where it has escaped from domesticity, may be a magnificent improvement of the wild ass in the very earliest age of the world: bearing in mind, that both in the animal and vegetable creation, the diversities arising from inscrutable causes in the wild races of the forest, are of a more unalterable character than those which spring up under the care and cultivation of man. With respect to animals in their wild state, their union with their own species seems to be mainly guided by voice and smell, and in domesticity that instinctive preference is evidently much weaker, and the will to keep themselves distinct is therefore lessened. The various species of greenish wrens are so similar in plumage, that it requires nice examination to distinguish them, yet they have different notes, manners, and habits of building their nests, even when in the same locality; but we have no certainty that if their predilection for the voice and smell of their own race was weakened, they would not be capable of producing a fertile cross; and we draw our conclusions from a few instances of domestic mules between species which happen to be widely removed from each other, as the pheasant and fowl, the goldfinch and canary bird; whereas we should apply to this subject, concerning which our knowledge is very limited, the consideration of the fact ascertained concerning vegetables, which have no will to interfere with our experiments, that some crosses are sterile and some quite fertile, without any apparent reason, except the greater or less approximation of constitution in the parents: and that the cross-bred plant, which has seemed for a long course of years to be absolutely sterile, becomes under some circumstances productive.

In accordance with the principle above stated, when it was shown that the botanic subdivisions of Rhododendron, Azalea, and Rhodora, comprehended plants which were capable of intermixing, I asserted that the botanist must reconsider and alter his subdivisions, and acknowledge that, notwithstanding their peculiarities, they constituted but one genus or kind. Conformably with this suggestion, Mr.

Sweet, in the second edition of his Hortus Britannicus, has since wisely added to Rhododendron the genera Rhodora and Azalea, with the exception of Azalea procumbens, though in his subdivision of the pelargoniums he has not kept in view sufficiently that certain and unalterable guide. The true meaning of species, not as the word used to be explained by botanists, but as it is in fact used in all botanical arrangements, appears to be, the subdivision of the genera or kinds into branches, which naturally maintain themselves distinct even when approximated, though they may be more or less capable of artificial or accidental intermixture; while a local variety will reproduce itself when isolated under particular circumstances of soil and climate; and a seminal variety will not with equal certainty reproduce itself in the same form anywhere, being more ready to intermingle with others of like origin. In fact, there is no real or natural line of difference between species and permanent or descendible variety, as the terms have been applied by all botanists; nor do there exist any features on which reliance can be placed to pronounce whether two plants are distinguishable as species or varieties. Any person, who attends to the subject, will perceive that no botanist has laid down any precise rules by which that point of inquiry can be solved, and that the most variable, contradictory, and unsubstantial features have been taken by different persons, and by the same person on different occasions, to uphold the distinctions they proposed to establish; the truth being that such distinctions are quite arbitrary, and that, if two plants are found capable of interbreeding, when approached by the hand of man, they are as much one as if they were made to intermix more readily and frequently by the mere agency of the wind, or assiduity of insects; and are not separable with more truth by any positive difference, than the varieties which cannot be prevented from crossing with each other when in the same vicinity. It remained to be ascertained whether there did exist a real, natural, and indefeasible difference between plants which could produce a fertile and those which could produce only a sterile offspring by blending their races. It was my opinion that fertility depended much upon circumstances of climate, soil, and situation, and that there did not exist any decided line of absolute sterility in hybrid vegetables, though from reasons, which I did not pretend to be able to develope, but undoubtedly depending upon certain affinities either of structure or constitution, there was a greater disposition to fertility in some than in others. Subsequent experiments have confirmed this view to such a degree as to make it almost certain that the fertility of the hybrid or mixed offspring depends more upon the constitutional than the closer botanical affinities of the parents. The most striking and unanswerable proof of this fact was afforded by the genus Crinum, which is spread round the whole belt of the globe, within the tropics and within a certain distance from them, under a great variety of circumstances affecting the constitution of individuals, which nevertheless readily intermix, when brought together by human agency. The plant called Crinum Capense (formerly Amaryllis longifolia), impregnated by either Crinum Zeylanicum or scabrum, both at that time also called Amaryllis, produced offspring, which during sixteen years proved sterile, probably because, notwithstanding their botanical affinity, the first is an extra-tropical aquatic plant, and the two latter tropical plants which affect drier habitations and readily rot, at least in this climate, in a wet situation. The same C. Capense, impregnated by Crinum pedunculatum, canaliculatum, or defixum, produces a fertile cross, though they are so dissimilar as to have been placed in different genera, and the author was formerly reproached by botanists as having committed an absurdity when he insisted upon uniting them. The reason of the fertility of their joint produce seems to be, that they are all aquatic or swamp plants; and it may be further observed that the crosses with the two former, the plants being all extra-tropical, are much more fertile than that between C. Capense and defixum, because the latter is a tropical plant. The mules between Scabrum and Capense having continued so many years with every appearance of absolute sterility, without any change of situation or treatment, at last produced one good seed in 1834 and another in 1835. These facts were of such an overbearing nature, that it became impossible for those, who had charged the author with absurdity for uniting the parents under the genus Crinum (to which even certain other plants were then asserted to be more nearly allied than the species at that time called Amaryllis), to contend any longer that they, producing a fertile offspring, were of different genera, and they will probably be never again disunited in any botanical work; but the facts furnish much ground for the serious consideration of men of science. It happens (as if expressly designed to overthrow the theory, that the identity of species is proved by fertility or sterility in the mixed issue), that, while C. Capense, Zeylanicum, and scabrum, are very similar in their general appearance, and yield an offspring which has been found quite sterile except in the case of the two seeds above mentioned, C. Capense and pedunculatum are as unlike as perhaps any two species of any known genus; and if it were asserted that C. Capense and pedunculatum are one species, and C. Capense and scabrum two species, the assertion would appear, to any person looking at the plants, too preposterous to require a serious answer.

In further confirmation of the fact that the sterility depends on constitutional discrepancy, or difference of what medical men call idiosyncrasy, may be adduced the curious plant figured in the Botanical Magazine under the name of Crinum submersum, which was found by my collector in a pond or flooded spot not far from Rio Janeiro, in company with a small variety of C. erubescens, and appeared to be exactly intermediate between that aquatic plant and C. scabrum, which grows on high ground amongst the woods. It is absolutely sterile, the anthers being always shrivelled and the pollen dry, and it is not materially different from the mules raised in our stoves between C. scabrum and a larger variety of C. erubescens, the latter being of course a finer mule, but with exactly the same barrenness of the anthers. C. submersum is certainly a natural cross, in consequence of the pollen of C. scabrum having been brought to the lake by some humming-bird or insect which touched the stigma of the aquatic species. The same sterility has been found in C. amabile and C. angustum, which are undoubtedly mules accidentally produced between dry-land and swamp-species, the former probably between C. Zeylanicum and procerum, the latter between C. Zeylanicum and bracteatum; as also C. longiflorum (Amaryllis longiflora of the Botanical Register), which is an accidental cross between C. Capense and erubescens, one variety of it having been produced at Demerara, the other in Jamaica. The fact being established with respect to one genus, that the species which have most botanical affinity and general likeness, if they delight in a different state of soil or of atmosphere, produce a barren cross, while the most dissimilar, if they possess the same constitutional predilections, give birth to a fertile plant, cannot remain as an isolated circumstance, but must be considered by every unprejudiced and philosophical mind with reference to the whole vegetable creation. I have lately heard it admitted in conversation by an eminent botanist, that he had almost arrived at the conviction that there was but one rose, meaning that there seemed to be no natural impediment to the fertile intercourse of the great variety of plants which constitute the known species of that extensive genus. Let it be observed, if the fact is so, the reason is apparent enough; that, although some roses will endure a little more cold than others, there is a sameness of constitution throughout the genus, which affects a dry soil and a temperate atmosphere. The genus Calceolaria embraces plants very dissimilar to the eye of the botanist, as well as of the unlearned observer, of which some are absolutely stemless, and bear only leaves and flower-stalks, while others are shrubby, and acquire a strong woody stem some feet in height; yet there appears to be no limit whatsoever to their intermixture, and their produce may be crossed again indefinitely. Are we, then, to come to the result that there is but one Calceolaria, oversetting not only the nicer distinctions of botanical science, but the difference between herb and shrub? The African Gladioli, excepting those which, like the European, present their flowers in front of the stalk, have been intermixed by me without any difficulty occurring, and the crosses of the most dissimilar have proved abundantly fertile, and four or five sorts have been blended in successive generations. Some of the complicated crosses have produced seed less freely, and one treble cross (Hirsuto-Cardinali-blandus) has as yet produced none that has vegetated, probably because the last male, G. hirsutus, is of a constitution much less suited to our climate than the other two. Are we then to come to the result, that these dissimilar species are all one natural Gladiolus? There is no outward sign of barrenness in G. hirsuto-Cardinali-blandus, which will probably bear seed under favourable circumstances; that there is no insurmountable natural impediment may be proved thus; the offspring of G. versicolor by hirsutus, of blandus by versicolor, and of Cardinali-blandus by tristis, have all borne seed, shewing that G. hirsutus is not of a separate race, and that the triple cross is not an impediment. I have crosses raised by me between the yellow Linaria genistifolia and the purple purpurea, and also between Penstemon angustifolium and pulchellum, both perfectly fertile and sowing themselves about the garden, and, from my having given them many years ago to more than one nurseryman, become common. It is scarcely possible to assert that these very unlike plants are respectively one, and at the same time to distinguish them from the rest of their own genera, especially the former. That whole portion of Amaryllideæ which constitutes the genus Hippeastrum, and was confounded by botanists with a portion of the genus Crinum, not only interbreed freely, but produce offspring invariably fertile, because they are all of like constitution, and impatient of excessive moisture, though some will bear more cold than others. Amongst the Pelargoniums a similar convertibility has been found to exist within certain limits, which, if duly observed, will be sure guides to ascertain the genera, into which they ought to be subdivided, and by which the botanist, who is desirous that his labours should not be overturned hereafter, must be in a great measure ruled in classing them. Amongst the Cacti or Cerei the prickly angular speciosissimus, the flexible flagelliformis or whip-plant, and the flat unarmed phyllanthocides, are nearly the most dissimilar, yet they have produced mixed offspring, which readily bears eatable fruit of intermediate appearance, colour, and flavour. The fruit of the speciosissimus is large, green, and well-flavoured, round oblong; that of phyllanthocides small, purple, and very inferior; the mule from the former has purple fruit of a medium size and taste. The cross from the former by flagelliformis is now ripening here a short angular fruit, quite unlike that of the mother plant. The fertility of these crosses, and readiness to vary the appearance and taste of the fruit, though derived from such very dissimilar parents, is one of the most striking results of our experiments. I have had no opportunity of attempting to cross them with the plants called echino-cacti, but I do not see a single point in the generic character given of those plants which can uphold it, and I believe them to be of one genus with Cereus, and capable of intermixing; but I have had no opportunity of examining the flower of any of the plants called Echinocactus myself. Amongst melons I have had the Cucumis osmocarpus from Mexico, bearing a small egg-shaped white fruit and a small flower and leaf, very different from the Cucumis melo, fertilized accidentally by its pollen, thus occasionally producing fruit of twice the natural size with red flesh. Lobelia speciosa is a cross between L. siphylitica and fulgens, yet it reproduces itself abundantly.

The more these facts are considered, and the more they are multiplied, as they will be by the daily experiments of cultivators in other genera, the more strongly will my original suggestions impress themselves upon every botanist, who will look on the subject without prejudice, that the genera of plants are the real natural divisions; that no plants which interbreed can belong to separate genera; that any arrangement, which shall have parted such plants, must be revised; that any discrimination between species and permanent varieties of plants is artificial, capricious, and insignificant; that the question which is perpetually agitated, whether such a wild plant is a new species or a variety of a known species, is waste of intellect on a point which is capable of no precise definition, and that the only thing to be decided by the botanist in such cases is whether the plant is other than an accidental seedling, and whether there are features of sufficient dissimilarity to warrant a belief that they will be reproduced, and to make the plant deserve on that account to be distinguished by name amongst its fellows. The effect, therefore, of the system of crossing, as pursued by the cultivator, instead of confusing the labours of the botanist, will be to force him to study the truth, and take care that his arrangement and subdivisions are conformable to the secret laws of nature; and will only confound him when his views shall appear to have been superficial and inaccurate; while on the other hand it will furnish him an irrefragable confirmation when they are based upon reality. To the cultivators of ornamental plants the facility of raising hybrid varieties affords an endless source of interest and amusement. He sees in the several species of each genus that he possesses the materials with which he must work, and he considers in what manner he can blend them to the best advantage, looking to the several gifts in which each excels, whether of hardiness to endure our seasons, of brilliancy in its colours, of delicacy in its markings, of fragrance, or stature, or profusion of blossom, and he may anticipate with tolerable accuracy the probable aspect of the intermediate plant which he is permitted to create; for that term may be figuratively applied to the introduction into the world of a natural form which has probably never before existed in it. In constitution the mixed offspring appears to partake of the habits of both parents; that is to say, it will be less hardy than the one of its parents which bears the greatest exposure, and not so delicate as the other; but if one of the parents is quite hardy and the other not quite able to support our winters, the probability is that the offspring will support them, though it may suffer from a very unusual depression of the thermometer or excess of moisture, which would not destroy its hardier parent. Such is the case with the beautiful mule Rhododendron Altaclaræ, of which the mother was a cross between Ponticum and Catawbiense, and the father the Nepal scarlet arboreum. We now possess a further cross by the impregnation of Altaclaræ by arboreum, which will probably come so near the father in its colour, that if, as expected, it should be able to endure our winters, we shall have nearly attained the result, which would be otherwise most likely impracticable, of acclimating the magnificent Nepal plant; for it does not appear that in reality any plant becomes acclimated under our observation, except by crossing with a hardier variety, or by the accidental alteration of constitution in some particular seedling; nor that any period of time does in fact work an alteration in the constitution of an individual plant, so as to make it endure a climate which it was originally unable to bear; and, although we are told that laurels were at first kept in hothouses in this country, it was not that they were less capable of supporting our seasons than at present, but that the cultivators had not made full trial of their powers of endurance. The notion of Mr. Sweet that the roots produced by cuttings are hardier than those of seedling plants is probably fanciful, if he meant permanently so, which alone would be of importance. They may be tougher at the first period of propagation, while the seedling is in its infancy, but that, if not permanent, could have no effect in acclimating a plant. In truth it is not the root that is tougher, but the nucleus or base of the cutting from which the roots issue, and in which the life resides, which is tougher than in a young seedling at the first. All his other experiments only tended to shew that some half-hardy plants would live through an English winter in very dry and sheltered situations, or during two or three years, till a more inclement season cut them off, but not that by any process of his they had become hardier; the word acclimating seems, therefore, to have been misapplied in his paper in the Transactions of the Horticultural Society. For the purpose of obtaining a large or a brilliant corolla, it will be probably found in the long run best to use the pollen of the species which excels in those points, because the corolla, in truth, belongs to the male portion of the flower, the anthers being usually either borne upon it, or in some manner connected with it by a membrane; but upon the whole an intermediate appearance may be generally expected, but with a great disposition to sport, especially in the seminal produce of the fertile crosses, as in plants which are apt to break into cultivated varieties.

Before I proceed to consider the various cross-bred productions of late introduction, which at present embellish our collections, I will enter into a short detail of the reports which I have seen of experiments on this subject, made on the Continent, together with my view of the opinions which have been advanced in them, and in a little work by Professor Rennie, the matter of which is chiefly extracted from the writings of Mons. De Candolle. Kolreuter's experiments* are detailed in the transactions of the Petersburg Acad. in 1777, and the five or six following years. I do not find any further reports of experiments made in Germany, previous to that of Gaertner, concerning the observations he had made in 1825, subsequent to the publication of those of the President of the Horticultural Society of London, and of myself, in its Transactions. He gave an account of the number of impregnations he attempted to effect, the particular subjects of his several experiments, and the failure or success of each. I cannot learn that he has since published any report of the germination of the seeds which he had obtained by those experiments, and no later statement was known to Mons. De

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* Relating to Lychnis and cucubalus, N. C. ac. Petr. t. 20. p. 431—448. Hybrid digitales Act. Ac. Petr. 1777. Do. Journ. de physique t. 21. p. 285—299. Other hybrid digitales, Act. Ac. Petr. 1778. Continuation of experiments on hybrid foxgloves, J. de phys. t. 21. 209—306. Hybrid lobeliæ, Act Ac. Petr. 1777.—J. de phys. t. 23. 100—105. Hybrid lycia, Act. Ac. Petr. 1778. Verbasca, 1781. Daturæ, 1781. Malvaceous plants, 1782. Flaxes, Nov. Act. A. P. t. 1. 339—346. Pinks, ib. t. 3. 177—284. There may perhaps be some other reports by Kolreuter, of which I may have neglected to make a memorandum. I believe one concerning Nicotiana.

Candolle, in 1832. I have no hesitation in saying that this report, which seems to have been accepted as proof of what Gaertner had done, is utterly fallacious. He has entirely overlooked the difficulty, and, in many cases, the impracticability with the utmost care of excluding the natural pollen; the insufficiency of a bag to shut it out, and the probability of its having been admitted even before the bag was placed over the flower. I have learned by endless disappointments to know, that no attempt to obtain a cross-bred plant can be looked upon as successful, till the seedlings raised shall have advanced in growth sufficiently to exhibit the type of both parents united in themselves; and I consider Gaertner's report of the cross-bred seeds he *has obtained*, to be nothing but a mere enumeration of the crosses he *has tried to obtain*; and I believe some of his supposed intermixtures to be impossible. The fact is, that in this country, where the passion for horticulture is great, and the attempts to produce hybrid intermixtures have been very extensive during the last fifteen years, not one truly bigeneric mule has been seen; and, although I by no means presume to assert that such a production is impossible, experience shews it to be improbable; and those, who fancy they have obtained one, must forgive my wishing to see it forthcoming, and to examine whether it is certainly of such descent as they suppose. Gaertner details his mode of proceeding, which is pretty similar to my own; but he does not seem aware, that, in spite of all possible precautions, the pollen will often escape unobserved, and will penetrate the coverings that may be used. He asserts that the moist juice of the pollen combines with that of the stigma, to fecundate the germen, a questionable point, that need not here be considered. The superabundant viscous juice on the stigma of Rhododendron appears to me to obstruct the fecundation, which I think takes place more readily when it subsides. Gaertner could not decide whether the fecundation is slow as Kolreuter imagined, or rapid as Hedwig asserted; but in microscopical observations the particles of pollen seemed not to be emptied in less than an hour and a half; and he found that, when the fecundation was as he thought complete, the particles afterwards superadded did not change form or colour; but that in hybridizing applications a greater quantity of pollen seemed requisite, in proportion to the distance of affinity, and that it was repeatedly consumed; and he fancied that its successive applications in such cases made the seeds more numerous and perfect, which is very probable; but he says that only in kinds very closely allied did he obtain the full complement of seeds, as for instance in the genus Datura, of which Metel and Lævis mix freely. He found the life of the stigma more prolonged, when it was not fertilized by its own pollen; which might be expected, because the complete saturation of the stigma had not taken place, after which it no longer receives the influence of the pollen. He states that in natural fecundations the change of the stigma took place sometimes in 85 or 100 minutes, usually in a few hours, at most in 24; but neither he nor any other person seems to have thought of ascertaining whether the influence of the pollen really fertilizes the germen within that period, or merely saturates the stigma; and, although I have not pursued a course of experiments to make that fact sure, I have some reason to believe that the truth is not yet ascertained. If the fertilization was complete, and the office of the stigma defunct, it might be cut off without any detriment; unless necessary to the mere nourishment of the ovules, whether fertilized or not, which does not seem probable; but I have repeatedly cut it off a few days after I had applied pollen to Rhododendron, and the result has been that no seed has been formed. The whole of my observations has led me to think, that at any period before the decay of the stigma the access of the natural pollen may supersede the influence of the foreign that may have been previously applied, if not from a closely allied species or variety; but that on the other hand no foreign pollen can act upon the germen after the stigma has been fertilized naturally. The incomplete saturation of the stigma in the first case enables the natural pollen to gain access; but, if the absorption of the pollen first applied causes immediate fecundation, it cannot be explained how the subsequent access of the natural dust should supersede it; and it has seemed to me that the natural pollen could supersede that of an Azalea on the stigma of an evergreen Rhododendron even after the flower had fallen off. This point, which I have not sufficiently investigated, might be elucidated by cutting off the stigma with portions of the style of various lengths at different periods after the application of pollen, and seeing in what manner the operation interferes with the fructification of the plant. Gaertner thinks it doubtful whether the corolla is essential to the fertilization of the stigma; my observation is, that its early destruction is very prejudicial to the growth of the germen and stigma, but that after their developement it is not usually essential. He observes that the corolla perishes more quickly and completely after fecundation, and is more persistent and sometimes withers instead of falling off, in cases of hybrid impregnation, as it does where impregnation is prevented; but he seems not to have distinguished the cases of successful and abortive hybrid impregnation. I observe that he admits that the viscous juice remains on the stigma of Datura and Nicotiana two or three days after fecundation, which does not exactly agree with his theory, and seems to mark that the stigma has not become quite inoperative. Some days elapse before any other signs of fecundation appear after the fall of the corolla, such as the enlargement of the peduncle, or strengthening of its articulation, and that period seems to him longer in hybrid impregnation, and the interval longer before the seeds are vivified. Both he and Kolreuter observe instances, such as I have found, of false hybrid fecundation, producing an enlargement of the germen, or even seeds with an imperfect embryo or without any. They remarked, that they did not usually obtain the full complement of seeds from a hybrid impregnation, unless the affinity was very close. My own observation is that this circumstance depends rather on the similarity of constitution, and is by no means universal, for I had a pod from Crinum Capense fertilized by revolutum, in which every ovule produced a seedling plant, which I never saw to occur in a case of its natural fecundation. He cites from Kolreuter that Datura metel and lævis have each about 600 seeds in a capsule; he found that a capsule from one of them fertilized by the other contained 640, and in another case 284; but that Datura lævis by Nicotiana rustica produced only 108 seeds, which were however apparently perfect and provided with an embryo; but I utterly repudiate the probability of that impregnation, of which he has not published the ultimate result. In Gaertner's list, I find Convolvulus sepium by Ipomœa purpurea (the Convolvulus major of nurserymen) 8 experiments failed; the converse 10 failed. Ipom. purpurea by Convolvulus tricolor 6 failed; 1 successful, which I greatly doubt. Datura lævis by Metel, 4 failed and 4 succeeded; by Hyoscyamus all failed; by Nicotiana macrophylla 3 failed; 1 succeeded; by Nicot. rustica 1 failed, 1 succeeded. Datura metel by lævis all succeeded; by Hyoscyamus failed; by Nicot. macoph. failed. Glaucium by Papaver failed. I make no doubt that when the seeds vegetated, the supposed crosses of improbable origin manifested themselves to be natural seedlings of the mother plant, or produced by the intrusion of some kindred pollen. Kolreuter raised mules (Act. Ac. Pet. 1780) between Lobelia siphylitica and Cardinalis both ways. He found them fertile by the pollen of either parent, and their pollen fertilized the parents, but he obtained no seed from the mule by its own pollen. Lobelia speciosa, or more properly Lowii, Bot. Reg. 17. 1455, was found in a border where siphylitica and fulgens grew; it was a mule from siphylitica, which seeds freely. That mule, intermediate and purple-flowered like those of Kolreuter, seeded abundantly with me standing in a border between the two parents, but the seedlings with one or two exceptions, did not approximate to either, but reproduced the mule with some variability of colour. Dr. Wiegman, in a tract published in the German language, has given an account of some interesting experiments. By sowing Allium porrum and Cepa in one bed, and tying the flower-stems together, he obtained plants intermediate between the leek and onion, which were fertile. By tying together Vicia faba hortensis (the garden bean) and Vicia sativa (the common vetch), he obtained cross-bred seed; the seedlings from the bean had flowers more purple, smaller pods and seeds, which when sown again, yielded plants that appeared to him not distinguishable from what he calls the known red-seeded variety. Those from the vetch shewed also a difference of blossom. In 1823 he sowed Pisum sativum (the field pea) and Vicia sativa (the common vetch) together; the seedlings showed a departure from the natural colour, and yielded grey seeds. From the twining Phaseolus vulgaris albus, and Phaseolus nanus which does not twine, he obtained crosses; some seedlings of the latter twining, and of the former bent and crooked, but not twining. From Vicia sativa (the common vetch) and ervum lens (the lentil) he also obtained a fertile cross. If these facts are correct, it is clear that the closely allied genera Faba, pisum, vicia, and ervum cannot be upheld as distinct; but, although it is a very common practice in England to sow peas and tares mixed with beans, I have questioned many intelligent farmers on the subject, and not one had ever heard of any adulteration in the seed in consequence of the mixed culti-

[illegible] cording to Dr. Wiegman's statement, ought [illegible] occurrence in such cases. On the other [illegible] en cultivated in Yorkshire a plant having the [illegible] vigorous field pea (Pisum), which produces seeds th[illegible] n[illegible] man would hesitate to call beans, and which when boiled have, I understand, more the flavour of beans than of peas; and the plant, though very fertile, has every appearance of being a mixed production between the two. The most extraordinary mule, however, that is asserted to have been produced on the Continent, is a cross between the cabbage and horse-radish, which Monsieur Sageret reports that he has obtained, and that it has produced seed-pods, some of which resemble the short pod or silicula of the Cochlearia or horse-radish, and some the long pod or siliqua of the Brassica or cabbage. Strange it is, that asserting such a result, he appears quite unaware of its importance, and does not state whether those singular and various pods contained seeds or proved abortive. He does not even state whether the plants so obtained were annual, like the cabbage, or perennial, like the horse-radish, nor does he describe them. I must therefore, without any offence to him, be allowed to consider the actual generation of such a mule questionable, till the mule plants are produced before the public, so that their conformation may be examined to see whether it is agreeable to their supposed origin, or at least their peculiarities accurately detailed, and the impossibility of a mistake rendered manifest. I have, however, always considered the separation of siliquosæ and siliculosæ to be very unsatisfactory, and have entertained great doubts of the established distinctions amongst Cruciferæ. In consequence of M. Sageret's statement, I tried in 1835 to impregnate a plant of Brassica with the horse-radish, and with the pollen of two or three other genera of Cruciferæ; but I did not obtain a single seed from at least fifty flowers, on which the experiments were tried, all other flowers being cut off from the plant. I beg to be understood as not denying M. Sageret's assertion, but requiring better proof of the accuracy of a fact so important to science, in which he may be mistaken, and more detailed particulars, and especially the production of the plants; and I invite M. Sageret to communicate one of them to the Horticultural Society of London, that opportunities may be afforded of examining it carefully.

Experiments have also been made on the Continent to establish within what limits the cucurbitaceous plants (melons, &c.), can be intermingled; but, the names used not being of general currency, I cannot state accurately the result. Dr. Wiegman extended his experiments to varieties of oats. The accuracy of his observations and those of Sageret ought to be thoroughly investigated, and the results produced before the public; and a more useful office, connected with its pursuits, could not be undertaken by the Horticultural Society of London, than to pursue those enquiries and extend them to other vegetables. An observation made by Gaertner and Wiegman (Berlin, 1828) as well as by Mr. Knight, that the offspring of hybrids revert to the maternal and not to the paternal type, is certainly erroneous, and Wiegman admits that tobacco (Nicotiana) and oats may be made by crossing again either to revert to that of the mother, or advance to that of the father. The offspring of the mule Passiflora cœruleâ-racemosa, both in Mr. Milne's garden and in mine, have notoriously approximated to the type of the father, and lost altogether the red colour of the original mother. It is certainly not correct as a general law, though some have stated it, that the number of seeds in one pericarp is smaller in hybrid, than in cases of natural, impregnation; it is true in some cases, and the reverse occurs in others. With respect to the conditions stated by Professor Rennie, as necessary to ensure success in crossing vegetables, it must be observed that the first, namely, that the blossoms should be nearly in the same state of advancement, is not accurate; for in some kinds, as for instance, Calceolaria, that which is to bear the seed should be much less advanced than that from which the dust is taken; and in others, as Pelargonium and Alstrœmeria, it should be much more advanced. In truth, the moment should be seized, when the stigma in the flower which is to bear the seed, and the pollen in the other, is in perfection. The second condition stated, that the anthers should be cut out early in the morning, is equally liable to objection, and cannot be applicable to all flowers, some of which blow in the morning, and others in the afternoon or evening. The necessary condition is, that the anthers be removed from the flower that is to produce the seed before the dust can escape from them; for which purpose in many cases, as for instance in Crocus, Erica tetralix, and others, the flower must be opened with great difficulty at a very early stage. The plant must be then placed in a situation where no natural dust can reach it, brought either by the wind or by insects; and the pollen from another flower, which is in perfection and not beginning to wither, must be applied to the stigma as soon as it is quite developed and mature, or rather sooner. The success of such experiments is always most probable when the plant, which is to be fertilized, has been forced, and no natural pollen can be brought to it accidentally from other plants, and, by forcing one of the intended parents, those, which flower at different seasons, may be made to intermix. But it should be always remembered that, except in cases where the anthers are very accessible, and not mature till after the expansion of the flower, it is almost impossible to be quite certain that no particle shall escape from them in the operation. It is incorrectly stated that we cannot cross plants which do not ripen seeds with us, for their dust may be used to fertilize one that will ripen its seed; for instance, the pollen of Zephyranthes carinata, which I have never known to bear seed in England, has fertilized Z. tubispatha. It is also very possible, if the fruit of one species is apt to perish immaturely from the unsuitableness of the climate, and the germen of another is not usually fertilized with us, in consequence of an imperfect formation of its pollen, that it may be effectually fecundated by the pollen of the other species, though neither would have borne seed separately. The deficiency of pollen is of frequent occurrence in the American Azaleas from the fault of our climate; but the pollen of Sprekelia and of Z. carinata is abundant, and their sterility does not arise from its defect, but from the temperature or exposure in which they are placed not being exactly adapted to the growth of their fruit.

The first hybrid amongst our liliaceous plants that appeared in our gardens was the mule between Hippeastrum vittatum and regium, which was circulated under the name of Amaryllis Johnsoni, having been raised by a nurseryman named Johnson. It was, perhaps, an accidental production, for it was offered to the public with an incorrect statement, that it had been raised by impregnating H. vittatum with the pollen of Sprekelia formosissima. He might, however, have made various trials, and have been deceived as to which of them had been successful. That statement has been since disproved by the failure of every attempt to fecundate any species of Hippeastrum by the pollen of Sprekelia, of which the separate generic character is thereby confirmed, and also by the facility with which plants exactly similar have been raised between H. vittatum and regium. The next hybrid of that order, that flowered amongst us, was the Crinum Goweni, which was raised from seed of C. Capense, impregnated with the pollen of C. Zeylanicum in the greenhouse of the Earl of Carnarvon, at Highclere, in 1813, by R. J. Gowen, Esq., and blossomed in my possession at Spofforth; and soon after the mules between C. Capense and Canaliculatum, which had been first raised by me at Mitcham about the same time, came into flower with other crosses at Spofforth. All the hybrid Crinums raised between Capense and tropical species, which are now very numerous, are hardy enough to stand out of doors against the front wall of a stove, where, if a mat is thrown over them in sharp frosts, they preserve much of their leaves through the winter, and from May to November continue throwing up a succession of flower-stems in great perfection. C. scabro-Capense bears the most beautiful flower; C. pedunculato-Capense is of the largest stature. The only other hybrids of much note in our gardens at that period were, to the best of my recollection, as follows:—The Rhododendron Azaleoides, obtained by the accidental impregnation of an Azalea by Rhododendron Ponticum, in the nursery of Mr. Thompson at Mile-End; the Rhododendron glaucum hybridum figured in the Botanical Register, and Azalea enneandra figured in the Botanical Magazine, which had both been raised by me at Mitcham and removed to Spofforth. Since that time we have had the Rhododendron fragrans of Mr. Chandler, and a very great number of similar crosses from American white Azaleas by Rhododendron Ponticum at Highclere. I am not aware at what period the beautiful mule pink which is common in our gardens made its first appearance, nor through whom, or in what manner it was obtained; but it was probably the produce of an accidental intermixture of a florist's pink with a crimson sweet-william. Mr. Sweet gives no date to the hybrid pinks. Several most beautiful mule Gladioli and Ericæ, which had been raised at Mitcham between the years 1808 and 1814, and removed from thence to Spofforth, had also flowered there, but had not been made known to the public till the year 1819, when an engraving of Crinum Goweni was published in the Horticultural Transactions, and a figure of two or three crosses of Gladioli appeared soon after in the same work. Those who raised pelargoniums from seed had found amongst the produce of certain species a great disposition to intermix and sport, which was occasioned by the accidental transmission of the pollen from one plant to another by the bees, which occurs perpetually in that genus, because many of its flowers are occasionally without anthers, or lose them before the stigma comes to maturity, which causes them to be fertilized by another flower; and in the year 1812 (taking the date from Sweet's Hortus Britannicus) the beautiful cross between Pelargonium Citronodorum and fulgidum was obtained from seed, and afterwards produced under the name ignescens; and, being fertile, it has become the parent of an innumerable variety of the most beautiful plants that adorn our greenhouses. P. ardens had been raised two years before between fulgidum and lobatum, and had first pointed out to cultivators that it was possible, through the pollen of P. fulgidum, to introduce its brilliant tint of scarlet under a variety of modifications, in union with the superior qualities of other species in which it was deficient; but a long course of experiments has shewn the impracticability of blending the plants allied to zonale (which are properly detached by Mr. Sweet under the name Ciconia) with the true Pelargoniums, which are however certainly of one genus with the bulbous rooted sorts that are found to interbreed with them, and have been improperly detached. Such plants as fulgidum and echinatum, which have a stem of a semi-tuberous nature and capable of enduring a long period of drought, form a curious link between the tuberous and fibrous-rooted species. The practicability of obtaining a cross between the hardy Passiflora cœrulea and its more splendid but tenderer congeners had been suggested in my communication to the Horticultural Society; and not long after Mr. Milne verified the suggestion by the production of three fine varieties by seed from the scarlet racemosa fertilized by cœrulea. These mules, though not absolutely sterile, are indisposed to fruit, but seedlings were obtained from them by Mr. Milne, which are approximated more in colour to the male parent cœrulea, and laboured under a suspicion on that account of having been the fruit of a second cross by cœrulea, which was flowering in the immediate vicinity. Some time after a solitary fruit was borne by one of Mr. Milne's plants in the conservatory at Spofforth, and although there certainly was a plant of cœrulea in another greenhouse in the garden, at a considerable distance from the plant, there was no probability of its pollen having reached the conservatory, though it certainly was possible that it might have done so. Twelve seedlings were raised from the fruit, which was small, shrivelled, and quite deficient in juice, and those which have flowered not only approximated in colour to cœrulea, having no tinge of the red of its female progenitor, but were inferior to cœrulea in the beauty of the flower, and tenderer than that plant; neither of which circumstances were likely to have occurred, if they had been derived from a second cross with cœrulea. In the same manner I have found that the seedlings from the crosses, between the scarlet G. cardinalis and the white or purplish G. blandus, are always disposed to degenerate from the colour of the more brilliant parent and approximate themselves to G. blandus, whether the scarlet cardinalis was the male or the female ancestor. It appears probable that this seeming disposition in fertile crosses to produce seedlings approaching to the least splendid of their parents, may arise from the effects of our climate upon them, which is more congenial to the duller coloured than to the brighter species; in which case it would follow, that if the crosses were planted in the native soil and atmosphere of their more splendid parent, the same degeneration of colour would not take place. This is, however, a conjecture which I have no opportunity of verifying. I was led in some measure to form it, by having once observed the flowers of the hardy Nymphæa alba of a pale rose-colour, after a fortnight of unusual and intense heat in July, which appeared to point out why the genus Nymphæa, which is white in our latitudes, is found blue nearer the tropics, and red under their influence. This suggestion does not, however, account satisfactorily for the mule offspring, being inferior to the mules themselves generated in a similar situation; but I have observed the seedlings from Hippeastrum Johnsoni or Regio-vittatum by its own pollen to have often a corolla both smaller and less brilliant than the mule plant itself, and this deterioration of the descendants may perhaps be in part attributable to the fertility of the mule being less vigorous and perfect than that of the original parents, when there exists some constitutional difference between them, which is the case in these three instances, Passiflora cœrulea being hardier than racemosa, Hippeastrum vittatum than regium, and Gladiolus cardinalis much more thirsty than blandus.

I have already spoken of hybrid cactaceous plants of the genus Cereus. Grandiflorus is also said to have been crossed with speciosissimus at Colvill's, and Ackermannius has bred with both phyllanthocides and speciosissimus at Spofforth, and I have been told that some of them have been also crossed with the very dissimilar truncatus. There is, therefore, every reason to suppose that the whole genus Cereus will intermingle, and the fertility of the existing crosses seems to open an unlimited field to the expectations of the cultivator. I entertain such doubt of the truth of the separation of Echinocactus that I would urge cultivators to try whether it will cross with Cereus. In no genus, however, are more valuable results to be obtained than in that magnificent ornament of our shrubberies, the Rhododendron, including the subordinate family of Azaleas, which together with Rhodora form part of the same genus. I had entertained an idea that the dwarf Alpine species would be found distinct from the rest of the genus, but I am satisfied the suspicion was unfounded, and I believe all the species to be capable of intermixing, though I have failed as yet in blending Az. Indica with any but its own immediate kindred. There is a strong plant at Spofforth from Rhodora Canadensis by Azalea Pontica (of which cross a great number were raised, but being very delicate when young most of them perished, as well as another cross from Rhodora by Rhododendron Ponticum), and small plants were raised from Rhodora by Azalea triumphans and Rhod. Ponticum. That by Az. Pontica will flower next spring for the first time. Four evergreen seedlings obtained from the seed of Rhod. Ponticum, which I had fertilized at Spofforth with pollen of Az. Pontica, have flowered at Highclere. Two produced yellow fragant flowers nearly of the colour of Az. Pontica, one had flowers of a paler yellow or lemon colour, and the fourth of an intermediate chesnut. I have raised many weak plants from the seed of Rhododendron by yellow and orange Azaleas, but I have found extreme difficulty in rearing them, and have lost them at an early age. I had the same bad success in trying to rear to maturity a pot full of mules between the white Australian Nicotiana suaveolens and the red Virginian Tabacum. The American Azaleas have intermixed with the Nepal Rhododendron arboreum at Spofforth, and under the care of Mr. Smith of Norbiton, at that time the gardener of the Earl of Liverpool, who also succeeded in obtaining seedlings from Rhododendron Dauricum sempervirens by the scarlet arboreum. The latter, which were curious little plants, are probably all dead, in consequence of his injudicious perseverance in exposing them at an early age in the open ground. I vainly endeavoured to rescue the last survivor from his hard treatment. It is remarkable that the difference of constitution between the Rhododendrons and the American Azaleas seems to render the mules more impatient of wet than either of the parents, which is manifested by a sickly variegation of the leaf, rendering it often difficult to rear them, and indicating the want of a more sandy and drier soil. This may be the consequence of crossing a deciduous with an evergreen species. It is probably on account of that discrepancy that no seed has been yet obtained from any Rhododendro-Azalea, though the crosses of evergreen Rhododendra are sufficiently fertile, and I have raised seedlings from Azalea Ponticâ-viscosa v. alba, and Calendulaceâ-viscosa v. rubescens, though neither are disposed to seed freely. The intermixture of the white Rhododendron maximum, which is not an accidental variety, but a widely-spread and permanent kind on the mountains of Jersey in America, with Ponticum, has afforded a beautiful white cross, which reproduces itself in perfection by seed, and from that, or the American white itself, with Azalea Pontica or the yellow Sinensis, or the still more splendid orange varieties of calendulacea, we may expect to obtain various Rhododendrons with more decidedly yellow flowers, hardier constitution, and larger stature than R. Chrysanthum. Seedlings from the white American Rhododendron, and also from a cross between Maximum and Ponticum, impregnated by me with pollen from Az. calendulacea v. chrysolectra, were in cultivation at Highclere, but they have been mislaid and perhaps lost. The fragrance of the Azaleas had been communicated to the Rhododendron, both by the Mitcham crosses and that of Mr. Chandler. The Indian Azaleas are probably capable of intermixing with the rest of the genus Rhododendron, and the beautiful lilac cross obtained by Mr. Smith abundantly between phœnicea and the white or ledifolia is very fertile, and has produced a great number of vigorous seedlings at Spofforth. Rhododendron Ponticum and Catawbiense have produced a cross which far excels the natural sorts in the size and complication of the umbels of flowers, and is amazingly florid, and the further cross Altaclaræ between that and the scarlet arboreum is of a colour beautiful in the extreme, and quite hardy enough to bear our winters, though more impatient of wet than the Pontic and American plants, more fragile, and from its inheriting the early habits of arboreum, very obnoxious to spring frosts. A profusion of seedlings, now of large size and flowering, were reared at Highclere from the American blush-coloured arborescent Rhododendron, probably the maximum v. purpureum altissimum of Pursh, which is more like to Ponticum than to maximum, and requires a specific name (I suggest Arborescens), impregnated by the scarlet arboreum of Nepal, and this cross will probably be of great stature and magnificence. The plants of that American species or local variety have broad oval leaves. I have another permanent variety of American Rhododendron raised from seed gathered by Fraser from a tree in Pennsylvania, which he stated to have been the largest he ever saw, and capable of being sawed into large planks. It has the leaf narrower than Ponticum, and unlike any of the three kinds which are ranged under the name maximum. I should include it under the name arborescens. The white Nepal arboreum, with a ferruginous underside to the leaf, and the beautiful but still rare campanulatum, are hardier than the red arboreum; and Dr. Wallich saw in one situation the red growing at a much higher elevation than it usually occupies, from which hardier variety he has given us hopes of obtaining seed; and from these sources, as well as from the bristly Rhododendron barbatum, when it shall flower with us, and the beautiful Rhododendron venustum of Silhet, which we hope soon to possess, our means of increasing the varieties of this desirable family will be multiplied. It is to be hoped that the seedlings which I have raised from the white Rh. maximum by arboreum, will not move so early in the spring and will suit our variable climate better. An intermixture between the white arboreum and the yellow or orange Azaleas will yield a plant of great beauty. The cross between Arboreum and Caucasicum has flowered and been duly appreciated. The mule Altaclaræ has been crossed again with a large red Azalea at Highclere, and Azalea Sinensis has yielded a most beautiful intermixture with the same red Azalea. The finest flowered cross I have seen is one that I possess between Arboreum and Catawbiense, and having forced this plant more than one season I have obtained seed from it, no other Rhododendron having been in flower at that time. The result is important, namely, that it requires no label to distinguish the offspring, which are as uniform and unlike all others in foliage as if they were a separate species; and so in fact they are, and, if planted by themselves in a congenial situation and climate, would be the parents of a distinct race. This cross I call Haylocki. The great complaint against the mules raised by the impregnation of the Nepal arboreum, is that they all partake of its irritability, and move so early that they are very frequently damaged by spring frosts. Finding them all as irritable as the male parent, I have lately raised from it crosses by R. maximum and others, hoping that such may inherit the tardier habits of the hardy male parent, which would greatly increase their value. They are as yet but two years old, and their constitution has not yet been sufficiently proved. In the lovely genus Rosa, I believe, little has been done except by the hand of accident, and the necessary consequences of cultivation and the approximation of species in gardens. Much remains to be accomplished, but our climate is not very favourable to the seeding of the more delicate sorts, and the continental cultivators do not as yet take pains to obtain the results that might be expected from a judicious combination of the species, when rosa lutea, sulphurea, and bicolor shall be brought into union with the fragrant, the double, and the ever-blowing individuals of other species. The first decided original cross that we know was brought by Fraser from America, where it had been raised between the musk cluster and the ever-blowing Chinese, probably by accident; and, having been sold to Mr. Noisette, it has been made to bear his name, and, being more fertile in France than in this country, it has become the parent of an extensive family of beautiful varieties. From this plant Mr. Smith raised by impregnation with the yellowish Indian rose a variety of some merit, but not a good flowerer under general circumstances; and Rosa ruga is understood to have been raised in Italy from the Ayrshire rose by the pollen of the Chinese odorata, but the fact is not authenticated, and, if I am rightly informed, the great variety of cultivated roses, is owing rather to accidental than artificial intermixture. It is particularly desirable that those, who reside in quarters congenial to the seeding of roses, should exert themselves to intermix the qualities of the most estimable species. Many have been lately introduced of which I know not the origin. The honeysuckles also offer an easy opportunity of improvement, by intermixing the fragrant and more vigorous with the yellow and the scarlet. Fruit has been grown at Spofforth from the common garden honeysuckle by Fraser's scarlet, but it was plundered, when on the point of ripening, by robins. I have plants which I have raised from an early pale honeysuckle crossed with hirsutum, and with flavum. The French have favoured us with some desirable magnolias from M. Yulan, fertilized by obovata and gracilis, but the admixture of the Chinese species with the magnificent grandiflora, and with the very hardy tripetala is probably still in expectation. One of the most interesting genera, on which the process of intermixture has been successfully attempted, is that of Calceolaria, because it embraces plants of a decidedly shrubby and tender habit, and others which are completely stemless, and capable of retiring to rest under ground in the temperature of a British winter, and colours very dissimilar, the yellow and the brownish purple; and because most of the numerous species which have been imported appear to intermix with the greatest readiness, producing an endless variety of forms. The natural effect of crossing a yellow with a purple flower should be to produce various shades passing from the intermediate coppery tinge to the two extremities of purple and yellow, and such is the case in the mixtures between arachnoeides and the different varieties of integrifolia; but the cultivators of this genus were surprised by the breaking of the intermixture of the purple arachnoeides with Corymbosa, which has some purple specks on the corolla, so as to produce yellow flowers, broadly blotched with dark and even blackish purple; but the subsequent discovery of a Chilian biennial species which has not yet been figured, and which I call C. discolor, blotched with a reddish purple in a manner somewhat similar, shewed that such an arrangement of colour was a natural variation of the genus, which the cultivator might therefore have expected, if all the natural species thereof had been previously brought to his knowledge. C. integrifolia in all its varieties, including the closely allied viscosa, is a woody shrub, attaining, if protected, the height of several feet (I have had viscosa ten feet high), but incapable of resisting many degrees of frost, while C. plantaginea is absolutely stemless, and so hardy, that although it loses its leaves in the open border, and disappears in the winter out of doors, yet even in the north of

England it pushes again in the spring, and is only liable to be lost by drought in summer, or too great a superabundance of wet in the winter season. The application of the pollen of the latter to the shrubby integrifolia at once reduces the stature of the offspring from that of a shrub to a low semi-herbaceous plant, not absolutely stemless, yet capable of retiring into winter quarters like C. plantaginea, and not exceeding a few inches in elevation. C. Herbertiana, though shrubby, has more affinity to the herbaceous species, being rather intermediate between integrifolia and corymbosa in its general appearance, and the effect of the application of its dust to C. plantaginea is to afford an offspring more absolutely herbaceous, and of which the leaves are partly radical and partly borne on recumbent sprouts. The same is the case with the cross between C. plantaginea and arachnoeides, which, though it pushes out a number of herbaceous branches, that die back in the winter out of doors, is perfectly hardy and spreads under ground, so as to form a large clump. The cross from C. plantaginea by rugosa (figured in the Botanical Register first under the name ascendens which is to be struck out, and afterwards a second time under the right name rugosa) grows but a few inches high, and is marvellously florid. It is further remarkable, that although the natural species in this genus have such diversity of habits, the crosses, as far as has been seen, are all fertile and able to intermix, ad infinitum, though they will not bear seed as readily as some of the natural sorts. Unfortunately C. corymbosa which has given us a cross with the most beautiful broken colours by intermixture with arachnoeides, called C. Youngi, from the nurseryman who first flowered it, is one of the most delicate species that have been introduced. C. plantaginea is covered with minute specks underneath, and the cross between it and arachnoeides is inclined to continue speckled, and not to receive the ornamental blotch, but to change the whole tint of the corolla. The cross of plantaginea with the annual crenatiflora is a hardy biennial one, but it has perished with me after flowering. C. floribunda, which endures a Yorkshire winter, may afford the means of elevating a conspicuous branching scape from an herbaceous stemless plant, and produce some very desirable crosses with species that have a more ornamental flower. One very singular monstrosity has shewn itself, though not permanently, yet frequently amongst the mules from C. plantaginea; the flower has assumed a form totally different from its natural shape, being like a bag or purse two inches long, widest in the middle, and gradually tapering almost to a point at the two extremities. Sometimes one or two such are on a stalk amongst the natural flowers, and sometimes nearly a whole head has consisted of them. This may authorize an expectation of very curious garden varieties being hereafter produced in this genus. The whole genus agrees in constitution, liking a clear air, and a very moist soil. The hybrid Gladioli, of which a large portion are sufficiently hardy, flower about the same time as the roses, and contribute quite as much in general effect to the embellishment of the garden by their fine colours and profusion of blossom. They succeed very well in the natural soil of the garden at Spofforth, which is a good yellowish light loam, suitable for barley, and also in the artificial borders of peat and sand, where, however, in a dry summer they stand more in need of water. These hardy crosses are between G. Cardinalis, blandus, carneus, inflatus, angustus, and tristis, and they vary with every shade of colour from white to scarlet, rose, coppery, and blackish purple, and some are exquisitely speckled in consequence of the cross with tristis. They succeed best when grown into a thick tuft, in which state the profusion of blossom is admirable, the cluster of bulbs and the old skins of decayed bulbs permitting the wet to drain away, and preventing the earth from lying too close and heavy on the bulbs in autumn and winter. Clusters have now stood undisturbed at Spofforth above twenty years, with the precaution of covering them with leaves from November to March or April. There is danger in disturbing and parting them, for numbers will rot if re-set separately; and, if they must be divided, it is best to do so in April, or, if it be done in the autumn, the roots taken up should be potted, and turned out again in the spring. The beautiful crosses with hirsutus, recurvus, and versicolor are more delicate plants, and do not succeed well in the border. I have not succeeded in obtaining any cross, on the correctness of which I can depend, by admixture with Gladiolus psittacinus (Nathalensis), and I do not believe that it will breed with any of the above. Like all the European species, it presents its flowers in front of the stem, which is erect; and repeated experiments have shewn that every flower of G. tristis which was touched with the pollen of G. Byzantinus only, failed of making seed, while every flower to which the natural pollen had access produced it, and I consider the union of Byzantinus with any of the species above enumerated, except Psittacinus, to be impracticable. I consider Alatus to belong to the same family as Psittacinus, and also a beautiful species imported, likewise, as I understood, from the neighbourhood of the Nathal river, which I propose to call G. oppositiflorus. It is now sold by the Dutch nurserymen under the name floribundus, which has been long preoccupied. Its flowers, twenty-four or more in number, present themselves alternately from the two sides of a robust erect stalk. Blandus, Cardinalis, &c. have the flowers rising upwards from the back of a bent stalk, and seem to constitute a family distinct from those which present themselves in front. G. oppositiflorus has the flower much undulated, white, dashed with pinkish purple. The genus Gladiolus ought to be divided into at least two sections or sub-genera. I consider a sub-genus to be such a portion of any genus as will not intermingle with the rest, and has some distinctive appearance, but insufficient to induce a belief of their original diversity. Seedling Gladioli will flower often the first autumn; the best treatment is to sow the seed in pots, and give them shelter till the seedlings are pretty strong, and then turn out the ball unbroken into the border, where they will produce a crowded nosegay of flowers of various shades of colour.

It is not, however, by crossing different species or local varieties of plants only, that the cultivator may add to the beauty of his collection. Much may be done undoubtedly by crossing judiciously the finest seminal varieties of such plants as have been already improved in our gardens, and are disposed to break into a multiplicity of forms or colours.

It is to be observed, that in some cases the seminal varieties of plants preserve themselves almost as distinct in their generations as if they were separate species: for instance, the cultivated double holyoaks, of which at least the orange, the yellow, the white, the black, the red, and the pink, may be raised with certainty by seed from plants of the several colours, although planted near together in the garden; and it is probable that if gardeners were to take the trouble of crossing them with the pollen of plants of a different colour, a greater multiplicity of hues would be procured. In carnations also the seedlings have a great disposition to follow the colour of the parent plant. I have had greater success than any other person in raising from seed double camellias of various tints and appearance, and some of the best have been produced either from single flowers or plants raised from single ones, impregnated by the pollen of double flowers, preferring, where it can be got, the pollen that is borne on a petal. The new seedlings that flowered with me in one spring for the first time were nine full double; three semidouble, of which one was very fine, and only three single; but such an unusual result is not to be obtained without particular attention to the mode of treating the mother plant while in flower and seeding: the method which I have adopted being to keep it in confined air, with a superabundance of water, even to the detriment of its health, and to prevent it from making young shoots, in a great measure, if not entirely, by which means an exuberant degree of nutriment is forced to the seed-vessel. The reason that the seedlings raised by some nurserymen are so very inferior is, that their plants are in the most luxuriant growth; and it cannot be expected that seed gathered from individuals growing with freedom and vigour, should not be more disposed to reproduce the natural form of the plant, than to yield the fine cultivated varieties, which are to be obtained from them when almost diseased by repletion. The finest double varieties of Camellia Japonica which I have so raised are as follows:—

From the single white by the pollen of the Pompone, 1. var. Spofforthiæ, or *Spofforth striped*, very large and very double, white, with a few pink stripes, and occasionally one or two anthers.—2. v. Maculósa, or *Calypso*, do.—3. v. Haylocki, or *Haylock's white;* pure white, rarely a few anthers. —4. v. Ebúrnea, or *Ebur;* very vigorous, pure white; somewhat waratah shaped.—5. v. Nivósa, or *Nitor;* double white, variable in form.—6. v. Fortuita, or *Fortúna;* very like var. 1. —7. v. Lactescens, or *Luna;* double white. From seedlings impregnated by the Pompone, which had been raised from the common single red by the striped.—8. v. Púmila, or *Circe;* regularly formed double white dwarf myrtle-leaved. —9. v. Ulantha, or *Hylas;* white striped with pink; flowers in four uniform compartments.—10. v. Lysantha, or *Lysimachus;* flowers if possible more regular than the buff or old double white, red with a watery white line and margin to each petal. A very erect plant of rapid growth with flowers of first-rate merit.—11. v. Victrix, or *Victoria;* own sister to Lysimachus, equally regular, of the colour of a full-blown cabbage rose, paler near the edges. From the Chinese semidouble by Pompone.—12. v. Picta, or *Alcméne;* very regular in general; with a pink stripe usually on each petal, the white changing aftér some days to blush, sometimes less regular, with one or two anthers; very beautiful. From the Pompone.—13. v. Spofforthiana rosea, or *Idúna;* superior to the Peony-flowered in form and colour; the flower has always some anthers like its parent. From the waratah by the striped.—14. v. Foliolósa, or *Amalthéa;* flower-shaped like the rose-scented peonia edulis, v. rosea, red, with about 350 petals.—15. v. Conferta, or *Odin;* fine double red, not regular. I have never seen any anthers in either this or the preceding.—16. v. Porrecta, or *Bellóna;* fine crimson; branches horizontal or weeping. From waratch by Pompone.—17. v. Modesta, or *Hebe;* flower nearly regular, of a delicate purplish pink. From waratah by 13. Iduna. —18. v. Rosígena, or *Penélope;* double red. From a seedling from single red by striped, fecundated again by striped. —19. v. Molesta, or *Némesis;* very double red, but a delicate plant.—20. v. Venósa, or *Venus;* flower regular, but not sufficiently full, red veined with white. This has produced but one flower yet, and I am not sure of its permanent superiority. Many others of much merit I have not thought worthy of being named; and amongst them is one full-double red, raised immediately from the common small-flowered single red. I have a great multitude of seedlings which have not flowered yet, from which I anticipate much beauty and variety. I scarcely entertain a doubt that the double pink Camellia Sesanqua (Maliformis of Lindley) is a cross-bred plant between C. Japonica and Sesanqua; and, from its seeming sterility, I cannot but suspect that C. reticulata is not a genuine species, but a cross, perhaps obtained from some species still unknown to us.

Mr. Chandler obtained some very fine varieties from the waratah, impregnated by the striped, one season, but those which he has raised since have not proved good. It is, therefore, probable that there was some difference in the treatment of the plant or plants which bore seed for him that season, though accidental and unnoticed by him. His finest productions are eximia, somewhat like imbricata, Bironi, one-while called concinna, a very remarkable flower, regular and oddly flattened, but very beautiful; Woodsi, a large rose-coloured flower, quite double, but cup-shaped and hollow in the centre, requiring a little warmth to flower it in perfection; Chandleri, striped, sometimes very fine, but not always equally so. His élegans, rosa sinensis, and flórida, are handsome also; corallína and althæiflora sometimes, but often producing poor semi-double flowers. His anemoneflora alba comes very near in flower to its parent the Pompone, with a much less hardy constitution. Mr. Gray produced three cross-bred seedlings, of which Press's eclipse is the best, and Colvill's nursery two speckled seedlings of considerable merit, though very irregular, and too muddy in the colour. I have seen no other seedling Camellia that deserves to be preserved, but I have been told that Mr. Gray has since raised a good red one. His former plants were said to have been crosses between the single white and Chinese semi-double. These observations may perhaps tend to the raising still finer varieties, when the mode of obtaining them is rightly understood. I have no difficulty in obtaining seed from any given flower of the Pompone or Middlemist's Camellia, by putting it in a house rather warmer, and with less admission of air, than suits greenhouse plants in general; impregnating the stigma, and taking off the corolla before it begins to decay, and cutting away the petals that adhere to the germen or young seed-vessel, that the air may have free admission to it; without which precaution it will perish in most cases from damp. The striped sorts have usually more white in their flowers when they flower early in the spring, and it seems that the seed ripened earliest in the year is the most apt to yield white or pied seedlings. There is a strange mutability in the flowering of Camellias, of which the Pompone, which has been called on that account variabilis, furnishes a striking instance. It has four distinguishable kinds of flower, the pure white and the red-eyed, which appear promiscuously, the brindled pink, and the rose-coloured, which may be kept separate with tolerable certainty by grafting from the branch that bears them, the rose-coloured form being the Peony-flowered of the nurserymen. There is a branch on my oldest plant of the peony-flowered, which has reverted to the pure white colour, an occurrence less common than the departure from it. Carnations, which have run to red, very seldom revert to the white-stripe. I have been informed that the

Chinese do not reckon seedling Camellias confirmed in their habit, till they have flowered six or seven seasons without becoming less double. I have not found any of mine, thus raised several years ago, degenerate from their first appearance. Of the Chinese, the double white, the buff, the fringed white, and, as far as we know, the red variety, called imbricata, are the only sorts that never bear anthers. Having cultivated the myrtle-leaved above twenty-five years, I never saw that variety bear an anther in my collection, except one season, when all the flowers on every plant of the kind had them, and they were found in two or three late flowers last year; but the seedlings reared from its pollen, of which great expectations were entertained, proved to be the worst I had ever raised, and it seemed that whatever peculiarity of the season inclined the flowers to deviate from their usual double form, and approach nearer to the fertile single-flowered original, disposed also the pollen to generate single seedlings. I have seen the myrtle-leaved with anthers at Mr. Knight's nursery, though the circumstance has been so rare in my own collection; perhaps it may be connected with the more or less luxuriant growth of the plant.

It is to be lamented that more experiments have not been tried to improve the races of agricultural vegetables by crossing. I impregnated in 1834 with great care the Swedish turnip (ruta-baga) with pollen of the white, and another branch thereof with that of the red-rooted turnip, which produces perhaps a greater tonage than the white, bearing both frosts and unfavourable summers better, and thriving in soils where the white does not succeed. The seed was sown immediately, and the plants of both crosses, though late, formed pretty good roots. The leaves differed in appearance from those of the Swedes, and did not, like them, retain the rain-water on their surface. In the following spring they were set for seed in two different situations where no extraneous pollen might have access. The flowers of the greater part were of the bright yellow of the two male parents; a smaller portion in each lot produced straw-colour blossom, like that of the Swede: but not one shewed the least disposition to an intermediate tint; and it seemed as if those two colours were incapable of blending, or modifying each other. I have a crop from their seed this year, but the season has been particularly unfavourable for all turnips; the fly destroyed the first sown, and the plants being again too backward, I do not think their value will be fully ascertained from the present crop.

There seems no reason to doubt that better varieties of wheat, oats, and barley may yet be obtained by combining the hardiness of one, with the productiveness of another sort, and the finer skin or greater weight of a third. I am inclined to think that I have derived advantage from impregnating the flower, from which I wished to obtain seed, with pollen from another individual of the same variety, or at least from another flower, rather than with its own; and as races of animals are known to degenerate, if they are perpetuated by the union of near kindred, it seems not unlikely that vigour may be given also to any race of vegetables by introducing a cross, though of the same kind, and especially from an individual grown in a different soil or aspect. To illustrate this, I will state a circumstance which occurred last summer in my stove. Nine very fine crosses of Hippeastrum were flowering there at the same time; one a natural seedling from Johnsoni or Regio-vittatum, two Johnsoni-pulverulentum, one Johnsoni-vittatum, one Psittacino-Johnsoni, one from Psittacino-Johnsoni crossed again by Vittato-Johnsoni, one from Johnsoni by Solandriflorum, and two from Vittato-Johnsoni by the same. Being desirous of blending again these plants which were all cross-bred, different flowers were touched with pollen from their several neighbours and ticketed, and other flowers were touched with their own pollen. Almost every flower that was touched with pollen from another cross produced seed abundantly, and those which were touched with their own either failed entirely or formed slowly a pod of inferior size with fewer seeds, the cross impregnation decidedly taking the lead. It appears to me that this circumstance may be analogous to the introduction of a male from another flock or herd, which has been found advantageous to the breed of domestic animals; and I would advise gardeners to try the effect of setting flowers with the dust from another individual in preference to their own, with a view to obtain an improved breed.

It is only from the superior efficacy of the pollen of another plant, that we can account for the circumstance of some hybrid plants, which breed freely with plants of either parental stock and fecundate them, not producing seed readily when left to themselves; for if their pollen is able to fertilize, and their ovary to be fertilized, there can be no positive sterility in the plant, though there may be a want of sufficient energy under certain, or perhaps under ordinary, circumstances. Many centuries of experimental cultivation must elapse before the subject can be, if ever, fully understood; and I cannot suppose that my present view of it will not require to be modified by the results of future investigation. For instance, there seems little prospect of being able to answer why the hybridizing process is so easy in some genera and so difficult in others, if equally facile of access, unless it shall be found to arise from greater or less constitutional conformity.

The genus Calceolaria affords greater facility than most others, because its stigma is nearly obsolete before the pollen of the flower is ready, and, in the earliest stage of the bud, it is easy to lift up the corolla, and take out the anthers, which are then comparatively large and exposed, and the stigma may be fertilized at that early period, when it is defended by the covering of the corolla from any accidental intrusion. Amongst the Amaryllideæ there is for the most part much facility of performing the operation in the several genera, the anthers not being reversed to display the pollen till a little while after the expansion of the flower; yet in the genus Hippeastrum there is a complete readiness of all the species to intermix when crossed artificially, and in the genus Crinum nearly so, while in Zephyranthes it is extremely difficult to obtain hybrid seed, and repeated disappointments occur from the escape of some particles of the natural pollen in taking out the anthers. In the genus Crinum one unintelligible impediment appeared for a long time to exist. C. Capense, which bred freely with every other species, refused to be fertilized by the tropical Cape-coast kinds, Broussonetianum, and petiolatum or spectabile. A seedling has, however, at last been obtained at Spofforth from C. Capense by the latter, which I believe to be correct, and it can scarcely be doubted that the difficulty arises from some constitutional peculiarities in those plants. In general hybrid plants have been found to be excessively florid, but sometimes the contrary has been the case, and there appears to be some impediment to the perfection of their blossom. The mule between Hymenocallis disticha and rotata, which was raised many years ago, whether it be in the stove or in the open air, where it grew against the front wall of the stove, throws up, after its proper time of flowering, an abortive scape, on which the buds are dead and discoloured, as

Amaryllis Belladonna does at the time its leaves push in the spring, when the previous autumn has been unfavourable to its flowering. In the course of above fourteen years since it was raised, it has only once attempted to expand its flowers, and that in a very unsatisfactory manner in the stove; but I have lately had reason to suspect that more wet is necessary to it than to either of its parents, and perhaps absolute immersion at the time of flowering. I may take this opportunity of stating that the plant which I fancied many years ago to have been obtained from C. Capense by Hymenocallis (then Pancratium) disticha, proved, as it advanced, to have been by C. Canaliculatum. There had been an error in the memorandum made concerning it, or the flower had been touched by the pollen of both plants. A very interesting Crinum, of which only one plant was raised, from C. defixum by speciosum for several years put forth abortive scapes, but it has flowered well the two or three last seasons, though it has yielded no increase in any manner; neither has the fine plant which was raised from Scabrum by Canaliculatum. One of the handsomest white sorts, from C. brevifolium by the larger variety of erubescens, having a strong red root-stem, somewhat like Amabile, has afforded many offsets but no seed. The only genus in which I had observed barrenness of the offspring appearing to arise from the botanical difference of parents, whose constitution seemed very similar, was Nerine, of which the crosses between the division with regular and that with distorted filaments had borne no seed; but in that case the discrepancy was so important that it might have been almost supposed to afford a generic distinction, and Mr. Salisbury had named the Distortæ Loxanthus. In. the article Nerine, p. 283, I have given an account of a mule from the distorted N. pulchella by the regular curvifolia, of which the flowers are exceedingly similar to those of the cross between undulata and curvifolia, plate 45, but more healthful and free. The last-mentioned cross, as far as I have seen, is quite sterile, the parents having differed not only in regularity of perianth, but in the mode of flowering; for the inflorescence of undulata is centrifugal—that of pulchella, as well as curvifolia, centripetal; from which conformity I anticipated the more probable fertility of the mule. That conjecture has been verified, since the former pages were sent to the press, by the production of healthy seed from the mule curvifolia-pulchella, and an abundant crop from two plants of curvifolia by the pollen of the mule, no other Nerine having been permitted to develope its anthers on the premises. Here, then, is a feature which had been overlooked, which seems, nevertheless, to have a powerful influence over the fertility of the offspring. The seeding of this mule is fatal to Salisbury's genus Loxanthus, if any doubt could have remained after the production of the former intermixture. In the tubular African heaths the pollen remains confined, unless the anthers are touched by something inserted, as the point of a pin or the proboscis of an insect, when they spring asunder and discharge it. This genus, therefore, affords greater facility of intermixing, and it is probable that some of the native species, which are said to be quite local, have been produced by accidental intermixture of two other kinds. There is a natural species of Goodia, quite permanent by seed, which I had many years ago named intermedia, but which appears in Sweet's Hortus Britannicus under the name subpubescens, which is so exactly intermediate between lotifolia and pubescens in all points, that it can scarcely be doubted that it might be produced by crossing those two species. Amongst other crosses of Ericæ, I obtained at Mitcham many plants from two very dissimilar, namely, from Jasminiflora by vestita coccinea, which had the foliage slender and near an inch long. The late Mr. Salisbury had conceived that those two species, being distinguished by a shorter and a longer and more pointed pod, were referable to two distinct genera to which he had accordingly assigned names, and he told me that I should fail in any attempt to cross them; which was answered by shewing him the seedlings then several inches high. They were all lost on, or soon after, removing to Spofforth before they had flowered, though one of them was above a foot high. The disposition to sterility which has been stated to exist especially in the offspring of parents of different constitutions, offers a great impediment to the unlimited use of crossing in the fruit-garden, but it is certain that great advantage may be derived by the cultivator, who will strive to bring together the various good qualities of the sorts between which no such obstacle exists; and the complete fertility of the fruit-bearing Cerei makes it very uncertain where such obstacles will be found to interfere, before the experiment is made. I have already mentioned that Crinum scabro-capense, though the pollen of different species was applied to it had continued about sixteen years perfectly sterile. In 1834 a plant of it which had been growing the greater part of that time out of doors in front of the stove, produced one small seed. It vegetated, but the leaf was from the first of a yellowish white, and the plant did not live many weeks. In 1835 it produced another and larger seed, the early part of the summer having been very hot both those seasons. This seed was sown in white sand to try to save it from perishing like the former, and a thriving young plant has been obtained from it. Whether they are the produce of its own pollen, or that of Pedunculato-capense, which grew beside it, cannot yet be judged with certainty; but the seedling now growing vigorously, has deep green leaves, and does not shew any approximation to the glaucous hue * of C. Capense, of which a large bed was not far off; and that hue would probably have been very apparent, if it had been so crossed again. I had often attempted to fertilize C. Capense by the pollen of this beautiful mule unsuccessfully, but the circumstance of the two seeds it has borne shews that it is possible to obtain such a second cross, which would be a great acquisition, as it would certainly yield a plant of hardier constitution, and able to bloom in our open gardens, with much greater beauty of flower than Capense itself.

I have not found as yet the results which might perhaps have been expected, and which Mr. Knight seems to have obtained, from carefully blending the pollen of more than one species before its application. I attempted to fecundate calceolaria plantaginea with the pollen of twelve species, most industriously mixed together, but very few seeds were ripened, and the produce differed very little from those which had been procured by the pollen of one of the twelve species. Further experiments are necessary to establish how far the influence of different males can act simultaneously, by admixture of the dust. I have obtained mule seed and natural seed from the same capsule, but they were probably formed in

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* Since these pages were prepared for the press, the supposed seedling from C. Capense by Spectabile, which had grown very slowly, having been immersed in water in the stove has pushed vigorously, and my present opinion is that it will prove to be a natural Capense produced by the escape of some particle of maternal pollen, notwithstanding all the precautions which had been taken. This seedling had been glaucous from an early age. The refusal of the W. African species, Spectabile and Broussonetianum, to breed with Capense is therefore not yet overcome.

different cells. Experiments should be made to ascertain whether, in cases of partial and imperfect fecundation, the pollen of another species, and even of nearly allied genus which could not alone fertilize the ovary, can act in conjunction with a single grain, or at least with an insufficient quantity of the natural dust to effect the fertilization, and occasion the seed to produce a variety, not actually hybrid, but in some degree departing from the natural form. See, above, the account of Hymenocallis amœna, var. lorata, p. 211. It is certain, by the result of many experiments, made at Spofforth, that the pollen of a nearly allied genus, which cannot effect the production of seed that will vegetate, will often cause some of the ovules to swell to a large, and occasionally to a preposterous, size, and become seed-like masses without an embryo, and the same circumstance has been observed in Germany; and, as it can act so far, I do not see the impossibility of its influencing the character of the produce, where the access of natural pollen is insufficient; and it seems to me questionable whether some of the singular varieties which occur among vegetables may not have been so produced.

A very singular occurrence in the history of cross-bred plants took place last year in the garden of my brother (Hon. Algernon Herbert), at Ickleton, in Cambridgeshire, which deserves the attention of naturalists. In 1834 he purchased a plant, grafted from a hybrid Cytisus, known to have been raised in France between C. laburnum and purpureus, of which the leaves are as large as those of laburnum, though a little different in form, the flowers of a dingy and rather coppery purple in long racemes. The plant purchased consisted of a strong laburnum stock about 8 inches, and a grafted scion about 16, high. Its growth that year was vigorous. In 1835, from a strong branch, which was not in existence when the plant was purchased, proceeded a small shoot a foot and half long, covered with small leaves of the exact size and very nearly of the form of those of the little C. purpureus, while the rest of the tree, having reached the height of 8 feet, had the usual large foliage, approaching in appearance to that of the laburnum. This extraordinary branch, which has in a great measure, though not exactly, assimilated itself to the structure and habits of that one of the two parents to which the mule had originally the least resemblance, has this year, like that parent, produced small flowers, four at each joint, from the axills of the leaves, in the same manner as C. purpureus, and of a colour more purple than the pendulous racemes on the other branches, which had about 16 flowers on a spike. This fact is scarcely less wonderful than if a mule, between a mare and an ass, were at three years old to acquire an ass's tail. It was positively stated to me, 30 years ago, by a nurseryman, that Spong's rose was not a seedling, but an accidental sucker from the rose de Meaux, which had assumed a different character of leaf and flower, and maintained its diversity: a phenomenon which, if true, appears to be in some degree analogous. I have also seen the flower of the yellow Austrian rosa lutea borne upon a branch of the two-coloured var. bicolor, improperly called a Persian species, purpurea, by Sweet; but certainly a garden cross from lutea. Jacquin had observed, also, that this two-coloured plant sometimes bore flowers entirely yellow.

I am not informed which was the female parent of the hybrid cytisus, but I entertain no doubt that it was the laburnum, because the foliage approximates to it, and the flower follows rather the colour of purpureus; as the mule Rhododendrons by Azalea Pontica have the evergreen leaf of the former, and are more disposed to follow the yellow colour of the latter. The natural leaves of the hybrid cytisus are about four times as long, and four times as broad, that is, sixteen times as large as those of the curious branch on which the leaves are as crowded as on C. purpureus; the general foliage of the tree, though altered from the exact shape of the laburnum, being little, if at all, reduced in size. I have been told, but cannot verify the fact, that a like circumstance has occurred in France to a plant of the same mule. Grafts or layers from the anomalous branch will in all probability preserve their acquired character, and be so propagated as a distinct plant.

It was apparent to me that no botanist had been able to distinguish Nicotiana, Salpiglossis, and Petunia, except by features which I knew to be unsupported by the fact, though Salpiglossis, in my humble opinion, has been erroneously placed in a different order and alliance from the others, plants with five stamina being considered Solaneæ, and those in which the fifth is wanting Scrophularineæ. I had ascertained the utter invalidity of that feature, having seen flowers of the same Salpiglossis with only four stamens, with five fertile stamens, and with four fertile stamens and one abortive; and, as in Nicotiana the fifth stamen is always of a different power and inserted differently from the other four, I was inclined to believe them to be one genus, and I made a great many attempts to cross them, but in vain. On further examination of those plants I find a diversity of the seeds, which are very small, and must be examined with a magnifier. Those of Salpiglossis are angular; see pl. 43. f. 50. In other respects, although its aspect is easily recognized, it is not so easily separated by any decided distinction from Nicotiana; and it has been incorrectly characterized by one of the stamina barren, since the fifth is sometimes entirely wanting, and sometimes fertile. The character of Nicotiana in the Bot. Mag. is quite untrue; founded on one species, and inapplicable to others. That genus affords an instance of the unimportance of the more or less continued adhesion of decurrent filaments, the adhesion varying greatly in the different species. See the seeds of Nicotiana, pl. 43. f. 51 and 52. They are not angular, but more oblong and reniform than those of Petunia, which are nearly round, and pitted all over. See Pet. linearis, pl. 43. f. 48. I never doubted the diversity of Nierenbergia, but it stands yet undefined. Dr. Lindley characterised it by the reflex uneate lobes of the stigma, but the stigma will prove often a treacherous feature in botanical characters; and Professor Don, having found in N. aristata a stigma of which the lobes are very little more reflex than in Petunia, at once assumed that they were one genus. They are, I doubt not, substantially distinct, but the generic character of Nierenbergia must be, *Tube slender cylindrical, limb wide-funnel-shaped, stamina adhesive to the style and stigma.* I have never seen more than one seed perfected in a pod of Nierenbergia, the rest of the ovules proving abortive, and the capsule so small that it is often overlooked when ripe; the seed of filifolia is oval with the back rounded. See pl. 43. f. 47. I see nothing in N. aristata to reconcile it to Petunia. The lovely N. calycina has a much greater affinity to Petunia from its trailing inflorescence and general aspect; but, if Petunia can be shewn to be one with Nierenbergia, there will remain nothing to separate them from Nicotiana. I am, however, now almost satisfied of the diversity of Petunia and Nicotiana, wishing, however, cultivators to persevere awhile in the attempt to cross them; for Petunia and Nicotiana have much closer affinity than the others, and their distinction is more questionable. I am, however, by no means satisfied that, if they are distinct, Petunia linearis (Salpiglossis integrifolia, Bot. Mag. Nierenbergia, Sweet's B. f. g.) may not belong to a fifth genus. It is certainly neither a Salpiglossis nor a Nierenbergia, and its seeds conform with Petunia, but it has a different aspect, and I cannot cross it with the other sorts of Petunia. It will belong at least to a separate section of Petunia with linear leaves. It is very remarkable that, although there is a great difference in the form of the flower, especially of the tube, of P. nyctanigenæflora and phœnicea, the mules between them are not only fertile, but I have found them seed much more freely with me than either parent. The mules I had raised from the former by the latter, having been forced early in the spring of 1835, set their seed before any other Petunia was in flower on the premises, and must therefore have been fructified by its own pollen. The white impregnated by the dust of the mule, and the mule by it, produce a great deal of sporting, but from a pod of the abovementioned mule to which no pollen but its own had access, I had a large batch of seedlings in which there was no variability or difference from itself; and it is evident that the mule planted by itself, in a congenial climate, would reproduce itself as a species; at least as much deserving to be so considered, as the various Calceolarias of different districts in South America.

I have little to add to this treatise, but my regret that it is necessarily so imperfect; and, from the nature of the subject and the additions made to it since it was first written, of somewhat too desultory a character. I hope, however, that it may have the effect of removing some erroneous impressions, and contribute its humble mite towards the elucidation of truth; and that, by giving the public a clearer view of what has been effected, it may enable those, who are disposed to pursue experiments on this subject, to conduct them with greater advantage. I have by no means enumerated all the genera in which crosses have been lately introduced, as for instance, Potentilla and Anagallis, in the last of which I have seen a remarkable result in the production of a reddish purple flower, by the union of the orange with the bright blue. I have an hybrid from the little Hibiscus ficulneus by manihot, which, with leaves that preserve the form of those of ficulneus, has the vigour and stature of manihot with its terminal spike, but with small axillary flowering branches also. I had likewise a cross from H. palustris by speciosus, but the plants were so delicate that all died before they had made a fourth leaf. I apprehend that several genera are comprehended under the name Hibiscus, which shews a great diversity of fruit, and an interesting course of experiments might be conducted to ascertain whether any cross can be obtained between those which differ in that respect, and whether they are all convertible within certain demarcations. Cultivators are too apt to believe they have obtained the cross they have been desirous of producing, when they have really a natural seedling variety. I can have no doubt in saying that the plant figured under the name Azalea Rawsoni, (Paxton, p. 123.) which Mr. Rawson's gardener fancied to be a cross between Az. Indica and Rh. Dauricum, is not allied to the latter plant, but a genuine Az. Indica, perhaps from a cross between two varieties of that plant. In speaking of the varieties of Camellia, I should have noticed Ford's handsome variety in Paxton's work, but I never saw it, and am ignorant of its origin.

AMARYLLIDACEÆ.

CHARACTERES BREVIORES.

Div. 1. Ramosæ. Subordo 1. *Xerophytéæ;* folia rigida.

1. *Xeróphyta ;* flores terminales, per. tubatum limbo regulari, antheræ lineares subsessiles.
2. *Vellósia;* flor. non term. per. campanulat. vix tubatum, fil. brevia interdum catervatim superflua, antheræ erectæ.
3. *Barbacénia ;* flor. non term. per. tubatum limbo reflexo, fil. bifida antheris adnatis longiora.

Div. 2. Caulescentes. Subordo 2. *Hypoxidéæ;* schistandræ, operculatæ. (*Weldenia?* vide p. 64.)

4. *Curculígo ;* folia plicata, tubus superne cylindr. fil. distantia, semina hilo profundè eroso.
5. *Molinéria ;* fol. plic. tubus brevis, antheræ fasciculatæ, semina subrotunda.
6. *Hypoxis ;* fol. plic. per. profundè sexfidum basi annulare, sub sole patens.
7. *Cœlanthus ;* fol. plic. per. campanulatum connivens.
8. *Anigozanthus ;* folia equitantia, per. tubatum limbo brevi infra profundiùs fisso.
9. *Lanária;* fol. equit. per. tubatum limbo regulari.
10. *Lophíola ;* fol. equit. per. profundè fissum limbo regul. reflexo, antheræ versatiles, stylus tripartibilis.
11. *Conóstylis ;* fol. equit. per. prof. fiss. limbo regul. semiexpanso, stylus conicè dilatatus.
12 *Phlebocárya ;* fol. equit. per. prof. fiss. antheræ subsessiles, stylus filiformis.
13. *Campynéma ;* fol. equit. per. prof. fiss. filam. recurva, styli partiti recurvi.
14. *Chæradódia ;* caulis umbellatus, sepala petalis diversa, stylus strumosus, capsula trigona.
15. *Alstrœmeria ;* caul. umb. rectus, sep. petalis div. per. quater dispar, stylus filiformis recurvus, caps. non an-

gulata operculo rigido attenuato valvis inferne dissilientibus, semina subrotunda tuberculata.

16. *Collánia;* caul. umb. nutans, sep. petalis div. caps. non angulata, operculo grandi pulpaceo.

17. *Sphærine;* caul. umb. subrectus, sep. petalis div. pericarpium indehiscens operculo obsoletiore.

18. *Bomárea;* caul. umb. tortus, sep. petalis div. caps. obtusè trigona superne dehiscens.

Subordo 3. *Agavéæ;* schistandræ, non operculatæ.

§ 1. *Dioscoreæformes;* caul. tortus, inflor. axillaris, venæ fol. sæpissimè confluentes.

19. *Tamus;* pericarpium extus evalve, integum. med. pulpaceo, intimo trivalvi septigero, sem. subrotunda testâ durâ.

20. *Testudinária;* caps. trivalvis, semina complanata. fil. basi lacin. inserta?

21. *Dioscoréa;* fil. toro inserta? caps. triv. sem, complanata.

22. *Rajánia;* caps. monosperma, alâ grandi incurvâ.

§ 2. *Ixiæformes;* radix bulbosa.

23. *Bravóa;* inflor. spicata, per. tubatum limbo brevi.

24. *Ixiolirion;* per. profundè fissum, regulare, stamina perfecta.

(*Tecophiléa?* per. profundè fissum, stamina, tria fertilia, tria abortiva. Iridáceæ?)

§ 3. *Agavéæ;* bulbus imperfectus vel caudex elongatus.

25. *Fourcróya;* caul. spicatus vel ramosus, per. non tubatum, filam. brevia incrassata, stylus strumosus.

26. *Agáve;* caul. spic. vel ramosus, per. tubatum, genit. filiformia.

27. *Doryanthes;* caul. capitulatus, per. tubatum, antheræ extinctoriiformes.

Div. 3. SCAPACEÆ; scapus succulentus infra spatham non articulatus.

Subordo 4. *Amaryllidéæ;* schistandræ, non operculatæ.

§ 1. *Cyrtanthiformes;* scapus cavus, germen ovale, caps. trivalvis, sem. testâ nigrâ, tubi faux ampla. Plantæ Africanæ.

28. *Cyrtanthus;* tubus curvatus, filam. recta tubo decurrentia.

29. *Gastronéma;* tubus curvatus, filam. conniventia, tria deflexa.

30. *Vallóta;* tubus rectus, filam. recta tubo adnata. Sem. basi longè-alatà vacua, chal. obliquâ, album. et embr. verticem (sæpius transversè) juxtaposit.

§ 2. *Hippeastriformes;* scapus cavus, germ. superne latius medio constrictum, tubi faux arcta, caps. triv. sem. testâ nigrà. Plantæ occidentales.

31. *Sprekelia;* per. prof. fiss. declinatum; fil. declin. fasciculata. 1-2 flora.

Pluriflore.

32. *Hippeastrnm;* per. declin. tubus infra abbreviatus, membrana faucialis ubi manifesta non annularis, limbus subpatens laciniis quater disparibus.

33. *Phycella;* tubus æqualis, limbus convolutus, membrana faucialis æqualis.

34. *Habranthus;* per. declin. tubus æqualis, limbus non convolutus, membrana faucialis annularis, fil. recurva, antheræ medio affixæ incumbentes.

Unifloræ.

35. *Zephyranthes;* tubus suberectus, limbus regularis, filamenta distantia conniventia, anth. infra med. affixæ suberectè incumb. Stylus declinatus.

36. *Coopéria;* tubus cylindr. erectus, limbus regularis (nisi defectu), stellatus, stylus erectus, fil. brevia fauci inserta, anth. tertiâ parte infer. affixæ recurvatim erectæ fasciculatæ.

37. *Pyrolírion;* tubus cylindr. erectus, limbus campanulatè reflexus, fil. recta patentia, stylus subdeclinatus.

38. *Haylockia;* tub. cylindr. erectus, limbus semipatens, fil. conniventia brevia laciniis inserta, sepalina profundiùs, anth. medio affixæ versatiles, stylus erectus, germen subterraneum.

§ 3. *Oporanthiformes;* scapus solidus (semina testacea?) Unifloræ.

39. *Gethyllis;* tubus longus cylindr. stylo inf. consolidatus, fil. tubi fauci inserta, interdum catervatim superflua, germen subterraneum.

40. *Sternebergia;* tubus cylindr. stylus liber, germen subterraneum.

41. *Oporanthus;* tubus brevis subinfundibuliformis, filam. æqualiter tubo inserta.

Scap. pluriflorus, (solidus?)

42. *Lapiedra;* per. profundè fissum, semina angularia nitida.

§ 4. *Pancratiformes;* corona staminifera.—1. semina testâ nigrâ.

43. *Tapeinanthus;* per. prof. fissum, corona brevis.

44. *Chlidanthus;* tubus cylindr. limb. semipatens, fil. alis membranaceis perianthio adnatis. [semina ignota.]

45. *Clinanthus;* tubus cylindr. limb. semipatens, fil. basi alatâ liberâ [inter se connexâ? semina ignota].
46. *Urceolína;* per. pendulum tubo cylindr. recto, limb. ventricosè campanulato. [fil basi connexa?]
47. *Leperíza;* per. pendulum tubo brevi subcylindr. recto, limbo angustè campanulato, corona brevis.
48. *Carpódetes;* per. tubo curvato cylindr. limbo subcampanulato, corona brevis.
49. *Coburghia;* per. tubo longo curvato cylindr. superne ampliato, limbo brevi regulari semipatente, corona cylindrica.
50. *Stenomesson;* per. tubo suberecto, mediâ parte constricto, superne ventricoso, limbo brevi regulari, corona brevis.
51. *Eucrósia;* per. tubo declinato, limbo compresso recurvo, corona declinata rutelliformis.
52. *Eliséna;* per. tubo cylindr. recto, limbo patulo reflexo, corona cylindr. declinata margine repando.
53. *Pancratium;* per. tubo cylindr. limbo patente, corona conspicua, antheræ breves suberectè incumbentes.

2. Semina carnosa viridia.

54. *Hymenocallis;* per. tubo recto cylindr. limbo flaccidè reflexo, fil. subconniventia, antheræ longæ versat. infra med. affixæ apice inverso pendulæ, semina oblonga.
55. *Chorétis;* per. tubo subrecto cylindr. limbo reflexulo, fil. erecta conniventia, anth. longæ versat. callositate quâdam supra medium affixæ pendulæ, semina subrotunda.
56. *Isméne;* per. tubo curvato, fil. conniventia deflexa, anth. longæ inf. med. aff. pendulæ, semina rotunda.
— *Callithauma?* bulbus cylindr. oblong. per. limbo patente, corona prægrandis, stamina exserta.
57. *Calostemma;* per. tubo cylindr. limbo semipat. recto, corona interdum fissa, fil. recta, anth. breves erectæ, germ. dissep. obsoletis sæpiss. dispermum.
58. *Vagária;* per. tubo cylindr. limbo substellato, corona imperfecta sexfida. [semina ignota; testâ nigrâ? genusne post Pancratium locandum?]
59. *Eurycles;* per. tubo cylindr. limbo semipatente, fil. recta, anth. erectæ, germ. dissep. imperfectis, loculis dispermis.

§ 5. *Amaryllidiformes;* scapus solidus, semina carnosa, fil. libera.

60. *Griffinia;* per. tubo declin. cylindr. limbo reflexo, laciniis inferis divaricatis, imâ porrectâ.

61. *Lycóris;* per. tubo declin. ampliato recurvo, limbo surs. curvato.

62. *Clívia;* per. pendulum, lacin. quater disparibus, limbi superficie super. incurvâ, infer. rectâ, peric. evalvi, integ. medio pulpaceo.

63. *Hæmanthus;* per. tubo recto limbo regulari, peric. evalvi, integ. medio pulpaceo.

64. *Búphane;* per. tubo recto limbo regul. caps. sicca trival. turbinatè trigona, ovula funiculo affixa.

65. *Ammócharis;* per. tubo recto limbo regul. caps. oblonga non pulpacea, ovula placentæ adnata.

66. *Crinum;* per. tubo subrecto cylindr. limbo subregul. fil. longa flaccida, anth. long. versat. germ. med. crassius, peric. dissep. obsoletis uniloculare, sem. difformia.

67. *Amaryllis;* per. tubo angustè infundib. fil. petalina petalorum basi, sepalina profundiùs inserta, caps. oblonga.

68. *Brunsvígia;* per. vix tubatum sursum curvatum genit. recurva, caps. turbin. trigona.

69. *Neríne;* per. basi annulari limbo reflexo, fil. pariter basi monadelphâ adnata, stylus filiformis, anth. incumb. versatiles.

70. *Strumária;* per. basi annul. limbo reg. subpat. fil. basi plùs minùs stylo strumoso adnata.

71. *Hesséa;* per. tubatum limbo reg. subpat. fil. subul. æqual. reflexa, stylus filiformis, anth. breves erectæ.

72. *Imhófia;* per. prof. fissum patens, stylus strumos. fil. disco inserta.

73. *Carpolýza;* per. tubo brevi infundib. limbo semipat. fil. tubo adnata, stylus crassus sulcatus.

Subordo 5. *Narcisséæ;* scapaceæ, schistandræ, non operculatæ, coronâ filam. includente.

74. *Corbulária;* fil. declin. recurva, anth. breves med. aff. incumb. versat. corona tubo longior.

75. *Ajax;* fil. recta, anth. longæ lineares subrectæ infr. med. affix. filamenta marginibus retro-concurrentibus amplexæ, corona tubo longior.

76. *Queltia;* limbus subpatens, fil. recta, anth. longæ lineares reflexæ infr. med. aff. filamenta non amplexæ, marginibus superne retro-concurrentibus, corona tubo brevior.

77. *Ganymédes;* limbus retroflexus, fil. recta, anth. acutè oblongo-ovales med. circiter aff. erectæ reflexulæ, mar-

ginibus vix apicem versùs retro-concurrentibus, corona tubo vix aut non longior.

78. *Narcissus;* fil. apice libera, anth. subsessiles subovales infr. med. aff. erectæ reflexæ marginibus retroflexis non concurrentibus, corona tubo quater ferè brevior.

79. *Hermíone;* fil. apice libera, anth. subsessiles acutè ovales medio aff. incumb. versatiles marginibus non retroflexis.

Subordo 6. *Galantheæ;* scapaceæ, porandræ, non operculatæ. Vide p. 80.

EXPLANATION OF PLATES.

PLATE I.

Fig. 1. Alstrœmeria Hookeriana, germen with sepaline rib taken off. 2. Do. with petaline rib taken off. 3. Alstr. aurea, valve of capsule. 4. Alst. Hookeriana summit of germen, after the fall of the perianth, magnified. 5. Do. germen side view. 6. Alst. aurea, germen. 7. Do. magnified; *a* sepaline scars, *b* petaline. 8. Alst. aurea, seed magnified. 9. natural size. 10. capsule. 11. peduncle and ribs adhering. 12. valve and ripe seeds. 13. portion of the axis on which the seeds were borne. 14. same with the seeds. 15. Alstr. Simsiana, seeds. 16. Do. capsule. 17. petaline filament of Als. Hookeriana. 18. Bomarea hirtella, ripe capsule. 19. Do. more open. 20. Bomarea acutifolia, germen, and tripartible style separated. 21. 22. Bom. hirtella, germen with sepaline rib taken off. 23. dry seeds of Bom. hirtella with the pulpy coat taken off. 24. blunt end magnified. 25. two fresh seeds with pulpy coat on. 26. one of the same seeds, the umbilical chord being pulled from the raphe to shew its real or ultimate attachment. 27. same seed with the pulpy coat taken off. 28. The end of do. opposite the point of attachment, being the internal chalaza. 29. Barbacenia purpurea, seeds magnified. 30. Curculigo orchioides, seeds, one of them showing the attachment. 31. same magnified: 32. stamen of Hypoxis sobolifera. 33. Do. germen, shewing one cell. 34. Do. style and opercle. 35. Do. germen magnified, a valve and dissepiment being removed, the stigma tripartible. 36. another species, germen and style. 37. H. sobolifera, germen and tripartible style. 38. transverse section. 39. other species, germen and style magnified, valve and dissepiment removed. 40. style and opercle. 41. The two species, ripe capsules. 42. Five seeds of H. sobolifera, nat. size and magnified. 43. Tamus, one of the internal valves of the capsule. 44. seeds. 45. Conostylis aculeata, capsule magnified from Bot. Mag. vol. 57. 2989. 46. Do. Germen and style magnified. 47. Alstrœmeria tenuifolia. Herb. Hooker. Gouan. colour very dark, apparently deep coppery red with pale edges. 48. Alstr. Preslana. Albiflora Prezl. from Prezl. 49. Alstr. spathulata from Prezl. Reliq. Hank. t. 122. 50. Leaf of Alstr. spathulata var. Herb. Hooker, los ojos de agua. Bridges. 51. Alstr. spathulata Herb. Hooker. Curbran. 52. Vallota purpurea, seed.

PLATE II.

1. Alstrœmeria inodora. 2. upper sepal. 3. lateral sepal. 4. lower petal. 5. lateral petal. 6. Alstrœmeria caryophyllæa var.

2. Mrs. Graham. Rio. 7. upper sepal. 8. lateral petal. 9. Alstr. Quillotensis, Herb. Hooker. 10. sepal. Herb. Lindl. 11. petal. 12. stamens ib.

PLATE III.

1. Alstr. angustifolia, var. conferta. 2. Alstr. recumbens. Do. petal, sepal, and filaments. Herb. Lindl. 3. Bomarea bracteata. Ruiz. specimen. Herb. Lamb. 4. Alstr. peregrina, var. albescens. Herb. Hooker. Cumming 568 Valparaiso; petal, and leaf.

PLATE IV.

1. Alstr. pulchella. Herb. Banks. Brazil. Spec. gathered by Sir J. Banks. name in Dryander's writing. 2. Alstr. angustifolia, var. Solliana. Herb. Lindl. 3. Do. var. acuminata Herb. Hooker. versicolor, Martius. 4. Bomarea macrocarpa Matthews 483. Herb. Hooker.

PLATE V.

1. Alstr. subrosulacea. Macrae, Valparaiso. Herb. Lindl. fertile stem. 2. sterile stem. 3. Bomarea Lutea. Herb. Hooker. 4. petal. 5. sepal.

PLATE VI.

1. Bomarea superba. Herb. Hook. 2. sepal. 3. petal. 4. Alstr. Isabellana. Herb. Hook. 5. lateral sepal. 6. lateral petal.

PLATE VII.

1. Collania dulcis, immature fruit and style. Herb. Hook. Matthews 864. 2. four-flowered specimen and tuber. 3. Collania dulcis Herb. Lindl. 4. 5. 6. Do. Cruikshanks. Herb. Lindl. 7. outline with fruit by Matthews. 8. Collania dulcis. Herb. Hooker. 9. Alstr. revoluta. Ruiz specim. Herb. Lamb.

PLATE VIII.

1. Collania Andimarcana Herb. Hooker. 2. sepal (orange ?) 3. petal paler tipped with green. 4. Alstr. pygmæa. Herb. Hooker. 5. stamen. 6. style. 7—13. Matthews's outlines, seemingly too large. 8. Do. stamen. 9. germen shewing the ovules. 10. entire plant. 11. flower. 12. petal. 13. sepal.

PLATE IX.

Collania involucrosa. Herb. Hooker. 1. sepal. 2. petal. 3. germen in an advanced state, and style. 3. 4, germen and style, Matthews' outline. 5. stamen. 6. stamen immature. 7. point of sepal, Matthews' seemingly too large. 8. point of petal do. 9. Coll. involucrosa. Herb. Lindl.

PLATE X.

1. Collania glaucescens. Herb. Hooker. Paramo of Cayambe. 2. with immature fruit. 3. Bomarea Halliana. Patacocha. Herb. Hooker. 4. Bomarea cornigera, var. Matth. 1659. Herb. Lindl. 4. one-flowered peduncles.

PLATE XI.

1. Collania puberula. Herb. Hooker. 2. var. acicularis.

PLATE XII.

1. Sphærine secundifolia, Ruiz specim. Herb. Lamb. 2. fruit from Flor. Peruv. 3. Sphærine distychophylla. Ruiz specim. Herb. Lamb. 4. with immature fruit, ib. 5. Bravoa geminiflora. Herb. Lindl. 6. leaf. ib.

PLATE XIII.

1. Sphærine nervosa. Matth. 1661. Second specim. Herb. Hooker. 2. Bomarea ovata, leaf.

PLATE XIV.

1. Bomarea pardina. 2. Bom. obovata; petal and sepal. 3. Bom. Patacocensis; petal and sepal. Herb. Hooker. 4. Bom. formosissima. Ruiz specim. Herb. Lamb.

PLATE XV.

1. Bom. glomerata. Herb. Hooker. 2. Bom. ovata var. nobilis and leaf. Herb. Hooker. 3. var. Tatiana. Mexico. ib. 4. Bom. crinita, and leaf. Herb. Hooker. 5. Bom. simplex, and leaf. Herb. Hooker.

PLATE XVI.

1. Sphærine coccinea from Flor. Peruv. 2. Bom. Caraccensis, and leaf. Caraccas, Fanning, Herb. Lamb. 3. Bom. Fanningiana and leaf. Herb. Lamb. Caraccas. 4. Bom. salsilla var. princeps and leaf. Valparaiso, Cumming. Herb. Hooker. 5. Bom. salsilla and leaf. Cruikshank 33. Chili. Herb. Hooker.

PLATE XVII.

1. Bomarea dispar. Herb. Hooker. 2. Bom. cornigera Matth. 1659. Herb. Hooker. 3. Do. broader leaves. 4. Bom. cornuta. Matth. 1161. misnamed anceps. Herb. Hooker. 5. Bom. edulis. var. Maranensis. Lindl.

PLATE XVIII.

1. Sphærine brevis. Herb. Hooker. Do. sepal horned, side views. 2. Bom. Cumbrensis. Jamieson. Herb. Hooker. 3. Bomarea fimbriata var. 4. Bom. tomentosa.

PLATE XIX.

Ixiolirion Tataricum. Altai. Spec. Herb. Lamb.

PLATE XX.

1. Ixiolirion Tataricum var. Scythica. Specim. Pallas. Herb. Lindl. 2. Ixiolirion montanum. Aleppo. Herb. Banks.

PLATE XXI.

1. Hippeastrum barbatum flower, and point of leaf. Herb. Linn. 2. Oporanthus luteus flower and fragment of leaf reversed; a

damaged specimen from Kew garden, labelled erroneously Amaryllis pumilio. Herb. Banks. 3. Oporanthus luteus from a better preserved specimen, marked Am. lutea; to be compared therewith. 4. Hippeastrum breviflorum spec. Tweedie. Herb. Hooker.

PLATE XXII.

1. Buphane guttata leaf, Herb. Linn. 2. Brunsvigia Burchelliana, leaf. Herb. Burchell. see B. radulosa p. 281, to be corrected Burchelliana, for I believe that I have the plant, and the green leaf is not so rasped as it appears when dry. 3. Hippeastrum ambiguum, (var.) Tweedianum. Herb. Hooker.

PLATE XXIII.

1. Habranthus Bagnoldianus (var.) Gillesianus, umbel and part of a leaf. Herb. Hooker. 2. Habranthus speciosus umbel, and three portions of a leaf. Herb. Lindl. 3. Pyrolirion aureum. Dombey's spec. Herb. Soc. Linn.

PLATE XXIV.

1. Cooperia Drummondiana var. chlorosolen stamen. 2. Cooperia Drummondiana. 3. Zephyranthes minima. Herb. Hooker. 4. Habranthus Andersonianus, var. Texana, leaf, inflorescence and stamen. Herb. Hooker. 5. Cooperia Drummondiana inflorescence and young leaves. 6. petal. 7. sepal. 8. stigma. 9. mouth of the tube open and stamens. 10. seed. 11. pollen magnified. 12. Phycella magnifica var. 2. 13. point of the leaf. 14. broadest part thereof. 15. var. 1. Herb. Hooker. 16. Tecophilea violæflora. 17. The same two-flowered. 18. Zephyranthes (or Argyropsis) candida; banks of the Plata. Herb. Hooker. 19. Cooperia Drummondiana, capsule.

PLATE XXV.

1. Phycella attenuata (var.) Macraeana; imperfect umbel and point of leaf. 2. var. obtusifolia; flower and point of leaf. 3. var. latifolia; flower, point of leaf and broadest part. 4. Phycella graciliflora; umbel and point of leaf. 5. Gethyllis undulata, leaf. 6. Gethyllis verticillata, fruit, bulb and leaves. 7. Gethyllis villosa; entire plant.

PLATE XXVI.

1. Habranthus pulcher; umbel, stamens and style. 2. Habranthus miniatus, one flower. 3. Habranthus pedunculosus. 4. Habranthus Andersonianus var. parvula. 5. Urceolina fulva; umbel and leaf.

PLATE XXVII.

1. Clinanthus luteus, two specimens, and inside of the tube with the stamens. 2. Chlidanthus fragrans.

PLATE XXVIII.

1. Stenomesson flavum; flower, stamens, and seed. 2. Stenomesson curvidentatum; flower and stamens. 3. Stenomesson

pauciflorum; bud, flower, and style, from Hooker. ex. fl. 4. Stenomesson croceum; flower and capsule. Dombey's spec. 5. Stenomesson coccineum; Ruiz. spec. 6. Stenomesson rubrum; Ruiz. specim. 7. Stenomesson breviflorum. Herb. Hooker. 8. The same. Herb. Lindl.

PLATE XXIX.

1. Zephyranthes gracilis. 2. Zeph. Grahamiana. 3. Zephyranthes Commersoniana. 4. Pyrolirion aureum. 5. Imhofia Burchelliana. 6. Hessea breviflora. 7. Hessea stellaris dissection. 8. Imhofia filifolia, 9. Carpolyza spiralis. 10. Strumaria linguæfolia. 11. truncata. 12. rubella. 13. undulata. 14. angustifolia.

PLATE XXX.

1. Hæmanthus undulatus. 2. strigosus. 3. brevifolius. 4. Acis grandiflora. Herb. Banks.

PLATE XXXI.

1. Hæmanthus incarnatus. 2. concolor. 3. tigrinus. 4. quadrivalvis. 5. sanguineus. 6. coarctatus. 7. moschatus. 8. rotundifolius. 9. hyalocarpus. 10. crassipes, 3-10 from Jacquin.

PLATE XXXII.

1. Brunsvigia minor. 2. Amaryllis grandiflora, var. Banksiana. 3. Crinum pusillum.

PLATE XXXIII.

1. Pancratium Illyricum germen. 2. the same after the decay of the flower. 3. flower and anther and magnified stigma. 4. Hymenocallis speciosa, stigma magnified, and anther. 5. Eurycles Amboinensis, stigma and anther magnified. 6. stamen and segment. 7. section of the flower and germen. 8. Ammocharis Coranica. 9. stigma magnified. 10. Vagaria parviflora from Redouté. 11. Gastronema, sections of the flower. 12. Cyrtanthus obliquus. 13. glaucus. 14. lutescens. 15. Vallota purpurea. 16. Agave lurida, valve of capsule. 17. stigma magnified. 18. germen and base of the style. 19. seed. 20. Fourcroya longæva capsule. 21. style. 22. seed. 23. germen and style. 24. stamen magnified. 25. germen and stamens, 16-25. from Zucarelli. 26. Anther of Hymenocallis amœna.

PLATE XXXIV.

1. Seed of Zephyranthes Lindleyana. 2. Z. sessilis, var. striatula. 3. Z. mesochloa. 4. Z. sessilis, v. Ackermannia. 5. ripe capsule and seed of Z. atamasco. 6. germen magnified, ovule greatly magnified, and stamen of Z. tubispatha. 7. seed of Hippeastrum Regio-vittatum crossed again by Aulico-striatifolium, natural size. 8. Habranthus spathaceus. 2. Habranthus bifidus. 10. Galanthus nivalis, petal. 11. sepal. 12. stamen. 13. style. 14. Erinosma vernum sepal. 15. petal. 16. stamen. 17. style. 18. Leucojum æstivum, stamen and style. 19. Acis autumnalis, stamen.

20. style. Parad. Lond. 21.—21. Pancratium maritimum, seed sprouting. 22. seeds of the same. 23. Habranthus Andersonianus, capsule. 24. Zeph. mesochloa. 25. Pancratium Illyricum, ripe capsule and seeds. 26. germen. 27. The same at a later period. 28. Hippeastrum pulverulentum, section of the flower shewing the abbreviation of the tube below, and graduated insertion of the filaments. 29. ovule magnified. 30. germen magnified. 31. style and anther. 32. cell of Sprekelia formosissima, and ovule magnified. 33. Seed of Ismene calathina and amancaes. 34. Inside of the flower of Calostemma purpureum. 35. germen and style. 36. inside of the germen with two ovules. 37. capsule, two views. 38. seed. 39. Eurycles amboinensis, seed. 40. The same. 41. ovule. 42. inside of the germen a little later. 43. seed dissected. 44. capsule. 45. bulb taken out of the ripe capsule. 46. Hymenocallis augusta, germen. 47. Hymenocallis speciosa, ovule cut open to shew the embryo magnified. 48. germen. 49. Hymenocallis litoralis, shewing two cells. 50. Hymen. Caribea seed. 51. H. litoralis, seed cut open to shew the embryo.

PLATE XXXV.

1. Choretis glauca. 2. Ismene pedunculata. 3. Ismene amancaes stamen and germen. 4. Hymenocallis speciosa, stamen. 5. Zephyranthes Lindleyana.

PLATE XXXVI.

1. Brunsvigia multiflora, capsule and seed sprouting. 2. Amaryllis Josephiniana, capsule and seed. 3. Nerine lucida, flower, section of flower, stamen, stigma, and unripe seed. 4. Nerine curvifolia, from a dried flower for comparison of the structure. 5. Lycoris aurea, tube, and magnified stigma. 6. Clivia nobilis, dissections. 7. Buphane toxicaria. 8. ciliaris, flower and half ripe capsule. 9. germen and tube of Amaryllis Josephiniana. 10. magnified stigma of Am. blanda. 11. Zephyranthes tubispatha, stigma. 12. Bomarea acutifolia, capsule and seeds; *a* marks the foramen and umbilicus contiguous to it, *b* the chalaza. 13. seeds of the same magnified; the lower represents the seed with the pulp-coat taken off, the cord and raphe detached, but remaining in their position; on one side the umbilicus more highly magnified; the foramen on the protuberance, the umbilicus at its foot. 14. Zephyranthes carinata, stamen. 15. Z. Lindleyana. 16. Cooperia Drummondiana, stamen and stigma. 17. Habranthus, stamen.

PLATE XXXVII.

1. Hermione Corcyrensis. 2. Narcissus Verbanensis.

PLATE XXXVIII.

1. Ajax Pseudonarcissus, stamen before and after maturity. 2. Queltia incomparabilis. 3. Narcissus poeticus grandiflorus filament and anther. 4. gracilis. 5. patellaris. 6. tenuior. 7. angustifolius. 8. Hermione grand citronier stamen. 9. compressa.

10. bifrons. 11. primulina. 12. Tazetta before maturity, with section of the tube. 13. Corbularia bulbocodium. 14. N. majalis. 15. Ajax minor ovules. 16. Sulphureus. 17. Telamonius. 18. tubæflorus. 19. lorifolius. 20. Sabini. 21. Narcissus angustifolius. 22. tenuior. 23. Queltia incomparabilis greatly magnified. 24. Jonquilla. 25. triloba. 26. Calathina. 27. more advanced. 28. orientalis. 29. Hermione, grand citronier. 30. before impregnation. 31. Corbularia bulbocodium. 32. Ajax minor. 33. propinquus. 34. tubæflorus. 35. crenulatus. 36. bicolor anceps. 37. Pseudonarcissus. 38. Bicolor lorifolius. 39. Bic. breviflos. 40. Pseudonarcissus Andersonianus. 41. Sabini. 42. N. angustifolius. 43. Queltia incomparabilis unripe. 44. calathina. 45. Corbularia B. 46. Ajax moschatus. 47. Hermione Tazetta, ripe and unripe. 48. bifrons unripe. 49. Ajax propinquus unripe. 50. minor. 51. pseudonarcissus. 52. Hermione ripe seed. 53. Ajax moschatus. 54. Corbularia conspicua. 55. Narc. recurvus. 56. Ganymedes pulchellus.

PLATE XXXIX.

1. Queltia Macleaana. 2. orientalis var. 3. orientalis. 4. montana. 5. fœtida v. aurantia. 6. var. semipartita. 7. var. grisea. 8. odora v. calathina B.M. 9. Calathina minor. 10. interjecta. 11. rugulosa. 12. heminalis. 13. triloba. 14. læta (Curtisiana *Haw.*) 15. Jonquilla. 16. Ganymedes pulchellus. 17. stamen before maturity twice magnified. 18. Q. jonquilla do. 19. incomparabilis. 20. Ajax pseudonarcissus. 21. Queltia juncifolia, Herb. Bentham. 21. Qu. pusilla, Herb. Banks. 23. Ajax pumilus, Salisbury, Herb. Banks. 24. Cuneifolius, Salisb. Herb. Banks.

PLATE XL.

1. Narcissus recurvus. 2. Majalis. 3. patellaris. 4. Ajax pseudo-narcissus.

PLATE XLI.

1. Narcissus angustifolius. 2. tenuior. 3. planicorona. 4. gracilis. 5—14. Hermione brevistyla varieties. 15—23. Hermione Tazetta varieties. 24—25. Herm. Italica. 26. Queltia pumila from Redouté. 27. Hermione elegans from Desfontaines Flor. Atl. from a many-flowered umbel. 28. Tangiers spec. tube, cup, and sepal, Herb. Benth. perhaps obsoleta. 29. Herm. Serotina, tube, cup, and sepal. Sardinia Herb. Benth. 30. Knots on a scape thereof. 31. Outline from Desfontaines verified by a Sardinian specimen. 32. Choretis glauca seed. 33. Hilum thereof. 34. Choretis Galvestonensis. Herb. Hooker. 35. anther thereof. 36. part of a leaf of Drummond's bulb from Texas, supposed to be Chor. Galvestonensis.

PLATE XLII.

1. Pancratium Cambayense. Specim. Hove. Herb. Banks. 2. longiflorum. Herb. Banks. 3. Cooperia pedunculata. Mr. M'Nab's outline. 4. Dissection of C. pedunculata, twice the natural length and

breadth. 5. Dr. Graham's dry specimen, anthers and style seen through. 6. Tangiers two-flowered autumnal Hermione. Herb. Benth. perhaps obsoleta. 7. Panc. maritimum anther, Herb. Banks. 8. Panc. Carolinianum, ib. 9. Hymenocallis pedalis and expansa anther. 10. perianth and stamens of Lapiedra Placiana from Barrelius. 11. leaf thereof from the same.

PLATE XLIII.

1. Queltia juncifolia. Herb. Bentham. 2. Queltia pusilla. Masson. Herb. Banks. 3. Ajax festalis. Salisbury. Herb. Banks. 4. Ajax pumilus. Salisb. Herb. Banks. 5. Ajax cuneifolius. Salisb. Herb. Banks. 6. Hermione dubia, 2 flowers, Herb. Benth. 7. Do. 3 flowers. var. Herb. Benth. 8. Do. var. Herb. Benth. 9. Sternebergia citrina, from Flora Græca.

PLATE XLIV.

1. Crinum Capense (var.) riparium, germen and ovules. 2. C. Capense, germen, stigma, and fimbriæ thereon. 3. C. scabrum. 4. C. longiflorum, Bot. Reg. 303. 5. C. bracteatum (v.) angustius. 6. amœnum. 7. ensifolium. 8. spectabile, transverse section. 9. cruentum. 10. Canaliculatum ovules from one cell. 11. flaccidum. 12. erubescens, capsule burst. 13. Broussonetianum ovules. 14. spectabile. 15. seed thereof. 16. cruentum seed. 17. speciosum: 18. defixum. 19. brevifolium (v.) angustius. 20. Capense. 21. exaltatum. 22. Ammocharis Coranica ovules. 23. Crinum variabile. 24. Paxtoni. 25. Lycoris aurea, cell and pollen. 26. Vallota pollen. 27. Z. candida. 28. tubispatha. 29 Clivia. 30. Hæmanthus puniceus. 31. Eurycles Amboinensis. 32. Hymenocallis angusta. 33. Panc. Illyricum. 34. Ammoch. Coranica. 35. Crinum pollen (in water). 36. C. Capense, pollen. 37. canaliculatum. 38. scabrum. 39. Hippeastrum equestre. 40. in water. 41. Sprekelia. 42. Leucojum æstivum and Galanthus. 43. Ajax minor. 44. Hymenocallis speciosa. 45. Choretis glauca. 46. Galanthus seed. 47. Nierenbergia filifolia seed. 48. Petunia linearis seed magnified. 49. Pet. nyctanigenæflora do. 50. Salpiglossis. 51. Nicotiana Langsdorfiana. 52. Nic. Persica variously magnified. 53. Rajania Herb. Banks. fruit nat. size. 54. Rajania ovata. Herb. Banks.

PLATE XLV.

1. Nerine Mitchamiæ, hybrida. N. versicolor Herb. appendix. 2. N. undulata, seed. 3. curvifolia, seed. 4. Hessea breviflora, leaf. 5. Strumaria Baueriana flower magnified; Bauer's sketch, Banks. library. 6. Amaryllis ochroleuca, Ker. Part of Bauer's sketch, Banks. library.

PLATE XLVI.

1. Bomarea lyncina, one flower from a crowded umbel. 2. aurantiaca, do. 3. Hookeriana, do. 4. densiflora, do. 5. purpurea var. amœna, do. 6. Collania dulcis var. parvifolia. 7. Hæ-

manthus Hookerianus. For the descriptions see Supplemental Observations.

PLATE XLVII.

1. Habranthus punctatus. 2. Sternebergia Dalmatica. 3. Oporanthus Fischerianus. 4. Stenomesson coccineum. 5. Coburghia incarnata var. 6. Coburghia splendens. 7. Hippeastrum miniatum. For the descriptions see Supplemental Observations.

PLATE XLVIII.

1. Hermione æquilimba. Rangìs Mewahhar of the island of Malta. Narc. serotinus Zer. Fl. Melit. 2. peduncle, germen, section of the tube, the style, and three of the stamens. 3. cup. 4. stellate limb, the tube and cup being cut off. 5. anther. 6. Alstrœmeria versicolor. specim. Herb. Hooker. Reynolds. Antuco, S. Chili. 7. Hermione papyracea sepal. 8. petal. 9. germen, section of tube, the style, and three of the stamens. 10. cup. See Suppl. Observ.

SUPPLEMENTAL OBSERVATIONS.

By a lapse in transcribing the copy, which was not observed in correcting the press, in p. 27, l. 28, I have stated Azalea to be triandrous by defect, which should have been printed *pentandrous by defect;* and, in p. 39, line 2, by a like lapse, *every Amaryllidaceous leaf* has been printed, which should have been *every Amaryllidean leaf;* that is, every leaf of the fourth suborder.

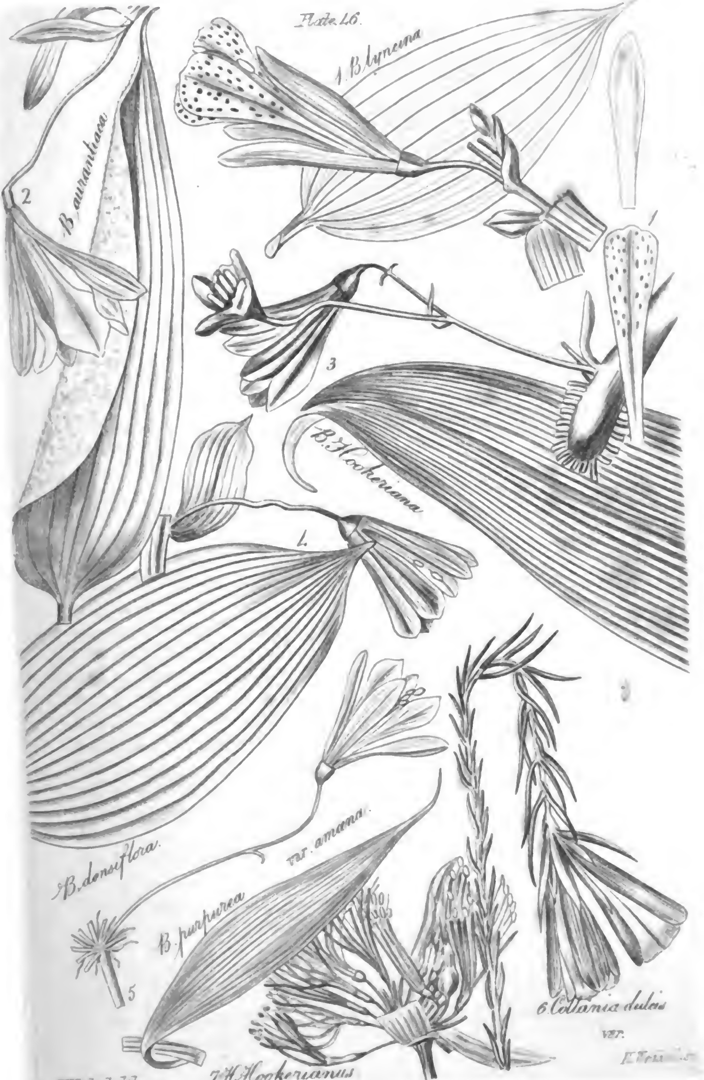
Allium Cowani.—The statement (151) that Allium Cowanium had been found by Drummond in Texas was founded upon erroneous information from Glasgow, and proves to be incorrect.

Alluvial Soil.—The soil which I recommend, under that name for the cultivation of Hippeastrum, Vallota, Nerine, &c., and even Cyrtanthus, is such as naturally inclines to produce crowfoot when it is in tillage.

Alstrœmeria Cummingiana.—This plant, having been in flower the whole summer in a border in front of a greenhouse, which is protected by a mat in frosty weather, has still a stem of flowers in November, and another advancing, after a heavy fall of snow, and some days subsequent frost. This, and Hookeriana, which are nearly allied, seem to be the hardiest sorts yet introduced. The capsule of A. pulchra has a long and stout operculous point; that of Cummingiana conforms more nearly with Hookeriana.

Alstrœmeria Isabellana.—Very fine specimens of this plant have been just received by Sir W. Hooker, from Mr. Tweedie, who says it is one of the most beautiful flowers of Rio Grande; the colour of the flowers orange tipped with green. His specimens have fuller and closer heads of flowers, which have preserved their colour, and some of the leaves are 5 inches long, and ½ an inch wide. They have a pale or yellowish cartilaginous margin. Folia suberecta, non resupinata, 2-5 unc. ¼-½ unc. lata, margine cartilagineo, umb. sub-16-flora, perianth. aurantiacum apice viridi. Found amongst the mountain marshes and rough pastures of Rio Grande. Very abundant near Portalegro.

Plate 46.


1. B. lyncina
1
2
B. aurantiaca
3
B. Hookeriana
4
B. densiflora
B. purpurea
var. amana
5
6. Collania dulcis
var.
7. H. Hookerianus
W. Herbert. del.
E. Fox sc.

ALSTRŒMERIA PSITTACINA.—The seed-pod of this species has only six angles at the summit of the germen and capsule, the subsidiary six being obsolete; and its seeds are much less tuberculated than the other species. These peculiarities probably extend to the section, with a prolonged and incurved upper sepal.

ALSTRŒMERIA PYGMÆA grows only on the highest parts of the Cordillera, not more than two inches high, in rich black soil.

I have said inadvertently (p. 103) that the soil for Alstrœmeria should be light. No general rule, as to earth, can be applicable to a genus of which some species grow in the clefts of rocks, and others in rich meadows. I find aurantiaca succeed well in alluvial soil, and I have no doubt that Hæmantha, and many others, will thrive better in the earth of a rich meadow than in a light compost, if attention is paid to the drainage. I even suspect that the diseased appearance which Alst. hæmantha (pulchella of the nurserymen) often presents, is owing to its being planted in a light, peaty compost. I have not found it so diseased in loam.

ALSTRŒMERIA, 20. SUBROSULÁCEA.—Pl. 5. f. 1-2. Herb. Lindl. Chili. Flower stem with few leaves, the two upper opposite; involucral leaves and peduncles three; peduncles bracteate, 3-flowered; flowers $1\frac{1}{4}$ inch long; colour evanescent; barren stem subrosulaceous; leaves resupinate, about $1\frac{3}{8}$ long, lance-oval 3-16ths wide. Seems to approach most nearly to Preslana. This description has been omitted by accident in the body of the work; it should stand before Preslana, which should be numbered 21, and the subsequent numbers altered accordingly.

ALSTRŒMERIA VERSICOLOR.—Pl. 48. f. 6. Specim. Herb. Hooker. Reynolds, near Antuco, S. Chili. This plant appears to answer exactly the description given by Ruiz of Versicolor, without any figure or specimen preserved, and I entertain no doubt of its identity.

AMARYLLIS.—As if Lamark's character of Amaryllis, in which the features assigned are successively contravened by contradictory alternatives, were not sufficiently unintelligible, I find that Trattinich (Auswahl von Gartenpflanzen) has added Ixiolirion, Hæmanthus, Brunsvigia, Gastronema, Strumaria, and Sternebergia, to the mass, and subdivided it into such fanciful sections, that *Ixiolirion Tataricum* figures *with* *some of the Nerines* in one, and *Ixilirion Montanum*, which is barely distinguishable as a species from Tataricum, with Hippeastrum regium, in another section. If the genera and species were thrown into a hat, and drawn out by lot, I should scarcely anticipate a more unsatisfactory result.

BOMAREA. § 1. *Pedunc. bi-pluriflori.* § § *Per. subæquale.*

A. *folia glabra, fl. circ. semunc. conferti.*

1. Salsilla.—v. 2. præcipua.—v. 3. subfalcata.

B. *fol. glabra, fl. med. magnit. laxi.*

2. edulis.—v. grandis.—v. Maranensis. 3. Caraccensis.

C. *fol. glabra, fl. magni, conferti.* 4. formosissima.

D. *fol. glabra, fl. magni, laxi.* 5. pauciflora.

E. *fol. pubesc. fl. circ. unciales, conferti.* Leaves downy, flowers near an inch, umbel crowded.

6. HOOKERIANA.—Pl. 46. f. 3. Specim. Herb. Hooker. Matthews ex prov. Chacapozas Peruviæ. Folia circ. 6½ unc. 1¾ lata, subtus nervosa, pedunc. 2-2¾ unc. numerosissima (100?) minutè superne bracteati, bracteæ involucrales semunc. lineares aut filiformes, per. ⅞ unc. lac. ¼ unc. latæ, petala infra magis attenuata, (saturatè aurantiaca ? sepala rubra ?) Leaves about 6½ inches, 1¾ wide, strongly nerved underneath, peduncles 2-2¾ long, secondary peduncles minutely bracteate, involucral bractes ½ an inch linear, inner ones filiform, perianth ⅞, segments ¼ wide upwards, petals more attenuated below, seemingly deep orange ; sepals red ?

F. *fol. pub. fl. circ. unc. laxi.* 7. bracteata. 8. acutifolia. 9. obovata. 10. hirtella. 11. latifolia. 12. cordifolia. 13. grandifolia. 14. ovata, v. 2. Tatiana. v. 3. nobilis. 15. macrocarpa. 16. hirsuta. 17. cornuta.

§ § *Petala sepalis longiora.*

G. *fol. glabra, fl. circiter unciales laxi.* 18. dispar.

H. *fol. glabra, fl. magni, conferti.*

19. LYNCINA.—Pl. 46. f. 2. Spec. herb. Hooker. Matthews ex Zambrabamba Peruviæ. Fol. ovata ac. 2-3 unc. 1-1¼ lata, bract. invol. externæ unciales, ⅜ unc. latæ, internæ parvulæ, ped. unc. sepala angusta 1¼ unc. longa, petala spat. 1⅝ unc. long. (aurantiaca ?) saturatè punctata. Leaves ovate, acute, 2-3 inches long, 1¼ wide, involucral bractes 1 inch long, ⅜ wide, inner small, peduncles an inch long, sepals narrow, 1¼ inch long, petals spatulate, 1⅝ long, dark spotted, seemingly orange. The flower seems allied to formosissima.

I. *fol. glabra, fl. circiter unciales, laxi.* 20. dispar.

§ 2. *Pedunculi uniflori.* § § 1. *Per. subæquale.*

K. *fol. glabra, fl. circ. semunc. conferti.* 21. glomerata. 22. torta. 23. Cumbrensis.

L. *fol. glabra, fl. circ. unc. conferti.* 24. Fanningiana. 25. fimbriata. 26. floribunda. 27. anceps.

M. *fol. glabra, fl. circ. unc. pauci.* 28. cornigera. 29. Halliana.

N. *fol. glabra, fl. magni conferti.* 30. Superba.

O. *fol. pubesc. fl. circ. semunc. conferti.* 31. setacea. 32. tomentosa. 33. denticulata.

P. *fol. pubesc. fl. circ. unc. conferti.* 34. Bredemeyerana. 35. Rosea.

36. DENSIFLORA.—Pl. 46. f. 4. Specim. Herb. Hooker, Matthews ex Chacapozos Peruviæ. Caulis glaber, fol. ovata acum. subt. pubesc. circ. 3½ unc. 1¾ lata, ped. numerosissimi, circ. 1¼ unc. ebract. bracteæ involuc. exter. ultra-unciales, semunc. latæ vel ultra, intern. filiformes, peri. ⅞ unc. (ni fallor, saturatè rubrum ?) sepala ang. obov. pet. spathulata. Stalk smooth, leaves ovate, acuminate, downy underneath, about 3½ inches long, 1¾ wide; peduncles very numerous, about 1¼ inch long, bracteless; outer involucral bractes above an inch long, ½ an inch wide, or more; inner ones filiform, perianth ⅞ long (seemingly deep red ?); sepals narrow obovate, petals spatulate.

37. PURPUREA.—Var. 2. Amœna. Pl. 46. f. 5. Specim. Herb. Hooker, Matthews ex Chacapozos Peruviæ. Fol. 3¼ unc. lanc. acuta semunc. lata, pedunculi biunciales, parte sup. minutè bract. per. ⅞ unc. sepalis ⅜ unc. latis (lilacinis ?) petalis spathulatis vix ¼ unc. latis. Leaves 3½ inches long, lanceolate acute; ½ an inch wide; peduncles 2 inches long, with a small bracte on the upper part; perianth ⅞ths long; sepals ⅜ wide; petals spatulate, scarce ¼ wide (sepals lilac ?). Var. 3. Guancana. ex Guancas Peruviæ. Herb. Hooker. Another variety from Guancas, with larger leaves, shorter peduncles, flowers and leaves apparently darker, which comes nearer to the plant of the Flor. Peruv.

Q. *fol. pub. fl. circ. unc. pauci.* 38. simplex.

R. *fol. pub. fl. magni. pedunculi longi.* 39. crinita.

S. *fol. pub. fl. magni, conferti.* 40. crocea.

41. AURANTIACA.—Pl. 46. f. 1. Spec. Herb. Hooker, Matth. Caulis densè pubesc. superne ¼ unc. diam. petioli crassi, fol. circ. 5-unc. 1¼-1½ lata, lanc. ovata tenuiter acum. subtus pallida enervia densè tomentosa, bract.-invol. externæ circ. unciales vix semunc. latæ, internæ tenues, ped. nume-

rosi 2½ unc. vel breviores, germ. parv. per. 1¼ unc. Sepala angustè obovata, petala spathulata. Ex mont. alt. hum. Panahuanca.—Specim. alt. ex Huanacabra, flor. et fol. col. ut videtur saturatiore. Stalk *densely pubescent*, ¼ of an inch diam. upwards; petioles thick; leaves about five inches long, 1¼ to 1½ wide, lance-ovate, slenderly acuminate, underneath pale, nerveless, very thickly pubescent; outer involucral bractes about an inch long, ½ wide; inner slender; peduncles numerous, 2½ inches, or less; bracteless, germen small, perianth 1¼ inch long; sepals narrow-obovate, petals spatulate. General colour orange, since it was named aurantia by Matthews. High damp mountains; Panahuanca. Var. ? with flowers and leaves seemingly darker, from Huanacabra.

§ § 2. *per. valdè inæquali.*

T. *fol. glabra, fl. magni, conferti.* 42. Caldasiana.

U. *fol. pub. fl. magni, conferti,* 43. pardína. 44. Patacocensis.

V. *fol. pub. fl. magni, pauci.* 45. lutea.

Coburghia incarnata, var. Pl. 47. f. 5. Spec. ex Peruviâ, Matthews Herb. Hooker perianthio circ. triunciali tubo saturatè coccineo limbo viridi. This splendid specimen of a Coburghia from Peru must be a variety of incarnata, with the flower shorter, the tube of a more orange red, and the limb more completely green.

Coburghia splendens. Pl. 47. f. 5. Spec. ex. Peruviâ, Matthews Herb. Hooker. (An incarnatæ varietas?) Perianthium coccineum apice virescens, laciniis longioribus acutioribus; folia carent. It is impossible to decide, without more perfect knowledge of these plants, whether this splendid flower should be considered as var. splendens of incarnata, or as distinct. It differs both in colour and the form of the segments of the limb. The leaves are wanting.

Coburghia fulva.—There is a specimen of Coburghia fulva from Lima amongst Matthews's last specimens.

Collania dulcis, var. parvifolia. Pl. 46. f. 6. Specim. Herb. Hooker, Matthews. In mont. alt. hum. Portachuela, Peruviæ. This plant is evidently a small-leaved variety of dulcis, having, perhaps, the petals yellower.

Crinum Haylocki, or Flaccido-bracteatum, hybridum, p. 274. Since the foregoing pages were printed, this very remarkable plant has flowered for the first time, November, 1836. It merits a particular description, as it now stands.—Bulb ovate, yellowish, 2½ inches diameter; neck of the bulb prolonged into a cylinder 5 inches long; leaves eleven, bright green, lorate, attenuated to an acute point, with a white smooth margin, the longest 4 feet 4 inches, 16 inches thereof erect, the rest pendulous, 1¼ to 1½ wide; scape green, two-edged, 15 inches high; spathe withering; bractes whitish, filiform, near 2½ inches long; flowers nine, successive; scent strong, somewhat like that of C. Amabile; peduncles ⅝ths, germen very slender, ½ inch long; tube green, 2-2¼ long; limb white, 3 inches long, expansion 5½; sepals with green points; filaments and style purple upwards; filaments near 1¼ shorter than the limb, ¾ths longer than the style; anthers a little shrivelled; stigma minute, white; cells with two or three ovules. This plant presents a striking instance of the filaments, at first approached to each other and recurved, becoming divergent by the subsequent great expansion of the flower, and explains the different posture in the patent and less-expanding species.

CRINUM HERBERTIANUM.—I have quoted from Dr. Wallich that this plant and Zeylanicum flower, in the rainy season, in ditches, but I suspect some mistake; for Dr. Carey mentioned Zeylanicum, latifolium, and speciosum, as flowering at various seasons, (speciosum almost colourless in the cold season,) and did not intimate that they had any aquatic predilections in Bengal, while he particularly pointed out defixum as the inmate of the wet ditches, and longifolium of the flooded meadows. I apprehend the plants seen by Dr. Wallich must have been on the ditch-bank, or at least in a situation subject only to occasional short submersion. They require to be quite dry in the winter, but a short inundation would not be injurious to them in the first vigour of their growth. It is evident, that in cultivation these bulbs should be abundantly watered for a short time while their leaves are growing.

CRINUM LINDLEYANUM.—A specimen of this plant from Demerara, in Sir W. Hooker's herbarium, has the leaves acute, ⅝ths wide, 18 inches long, exactly agreeing with some of the leaves of my plant; scape a foot, flowers eight, tube 4 inches, limb about 2½, style equalling the limb, exceeding the filaments near an inch.

CRINUM LODDIGESIANUM.—This plant has flowered late this winter, with a six-flowered scape, the bulb having grown to twice the bulk it had last year. Its nearest affinity is evidently to C. cruentum, and it should be removed from the place assigned to it, and stand No. 12, between cruentum and 13. erubescens. Its spathe this year was cleft, not tubed, as before.

CRINUM SEED.—See the representations of the seeds and germen of several species, pl. 43. The seed of the tropical species of Crinum will often lie for a very long time without vegetating. It may be made to grow immediately, by cutting carefully off a portion of the fleshy mass, so as to expose the point of the embryo, after which the seed should be set edgeways in a small pot of earth, just covering the radicle. The operation requires, however, a cautious hand; for if the point is cut by the knife, the vitality of the seed is destroyed, and its direction is uncertain, though more likely to tend towards the hilum or scar than elsewhere. Small bits of the flesh should therefore be pulled off with the point of a knife, rather than cut, till the embryo is discovered.

EUCROSIA BICOLOR.—The habitation of this plant is determined by a specimen in Sir W. Hooker's herbar. Jamieson, 1836, on the descent towards Jaguachi; elevation 1000 feet.

FLUED BORDERS.—The vigour with which mules of the genus Crinum, and many other plants, grow out of doors against the front wall of a stove, persuades me that a great variety of plants might with a little care be cultivated better in the open ground than under glass, if the border in which they are to grow were flued under ground, and a tarpauling, or any waterproof covering, placed over them at the times when it might be requisite to exclude either rain or cold. The covering might hang on the two sides of a strong longitudinal pole like the two slopes of a roof, and be made to roll up either with or without a spring. There are many plants which seem to enjoy a cool atmosphere, but will not flower or thrive vigorously without the stimulus of heated earth at the root. Having chosen a situation where a furnace and boiler could be placed under ground, I would carry the smoke-flue as far as its heat would extend on one side, and hot-water or steam-pipes in a different direction, as might be found convenient, enclosed in a stone or brick flue, to as great a length as its influence might reach. In such a border I believe the genus Hedychium, and many others, would flower perfectly with the assistance of fire in the summer, requiring nothing in winter but a covering to throw off the wet; and the heat might be turned into other pipes for the

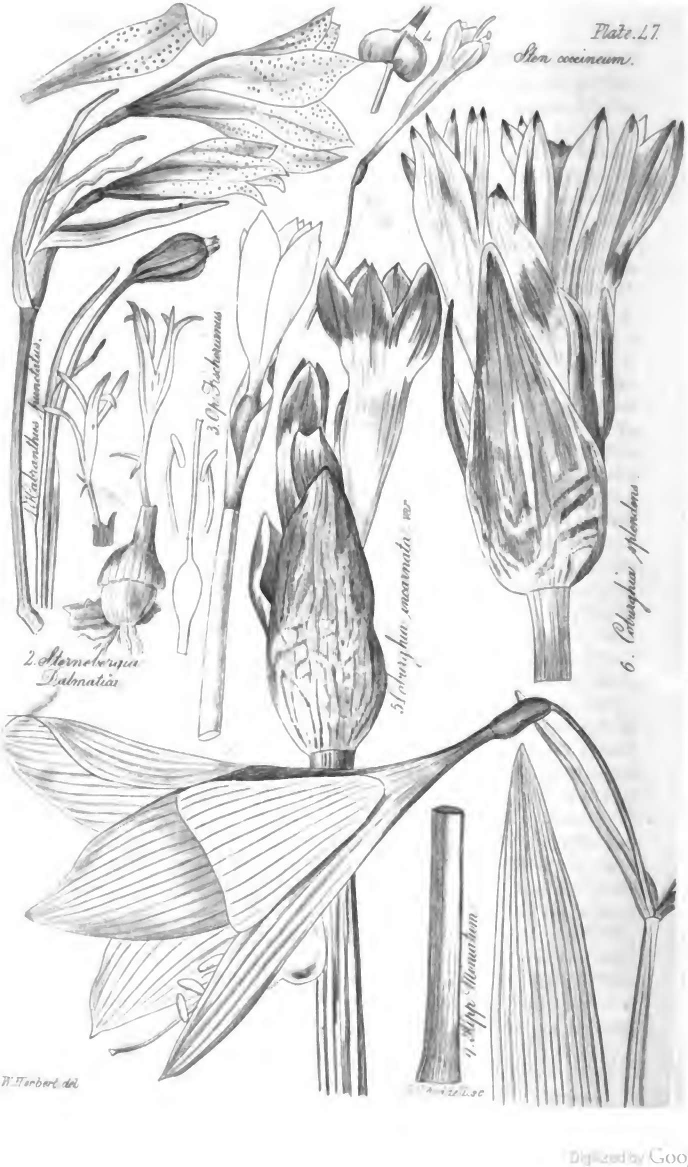


Plate. 47.
Sten coccineum.
4
1. Habranthus punctatus.
2. Sternbergia Dalmatica
3. Op. Fischerianus
5. Coburghia incarnata var
6. Coburghia splendens.
7. Hipp. Miniatum
W. Herbert del

advantage of plants which might require the warmth in winter rather than in the summer. If in front of a wall, a moveable verandah, which might be either ornamental or made of thatched hurdles or hurdle-gates, would throw off the wet, which is the principal cause of injury in winter, for many shrubs will endure the access of severe frost to the head, if all wet can be effectually excluded from the base of the stem and from the root by any sloped heading. Under such a verandah, with occasional heat to the flue, during the early summer, and perhaps in severe frost, Amaryllis, Brunsvigia, Buphane, Nerine, Hæmanthus, and all the allied genera of African bulbs, as well as the South American, would certainly succeed better than with any other treatment. I believe that not only those, but even some of the tropical Crinums, would succeed better so than in a stove, and probably many shrubs, which might not be expected to live there. The advantage of a verandah or pent covering, however rude, on the north side of a wall, for the protection of half-hardy plants, such as Camellia Japonica, Asiatic species of Rhododendron, &c. is not sufficiently known. It is the excitement occasioned by the access of the sun that makes such plants liable to injury, and a south aspect, whether in summer or winter, is prejudicial to them. I believe that the covering of a pent roof in a northern aspect, without any flue, is more congenial to those plants than a greenhouse, with caution to prevent any heavy rain or snow from being driven upon them by a strong north wind, which is easily done by hanging mats along in such an emergency.

Ganymedes Capax, flore pleno, p. 310. From the aspect of the bulb and young leaf of the plant sent to me under that name, I am satisfied that it is not a double Ganymedes, but a small Ajax allied to minor. I shall probably not see the flower before the publication of these pages.

Habranthus punctatus. Pl. 47. f. 1. Specim. Reynolds 54. ex Chili merid. Herb. Hooker. Folia carent; scapus 2-½ unc. biflorus, spatha 2-2½, ped. ¾-2½ unc. per. 1¾ tubo brevi (⅛ unc.?) limbo pulcherrimè punctato, (color roseus? marginem versus pallidior? punctis quàm plurimis, (saturatè purpureis?) The leaves are wanting. Scape 2½ inches, two-flowered, spathe from 2 to 2½ inches, peduncles from ¾ to 2½ inches, perianth 1¾, tube short, seemingly only ⅛ long, limb minutely and beautifully speckled with deep red or purple; general colour probably rose or purple, paler near the margins.

I find a quære (pratensis ? Poeppig) attached to the specimen, but that plant has a scarlet flower without any speckling, and cannot be the same.

Hæmanthus Hookerianus. Pl. 46. f. 7. Spec. C. B. Sp. Herb. Hooker, absque foliis. Scapus 8½ unc. gracilis, circ. 17-florus, spatha quadrivalvis 1½ unc. valv. lanceol. kermesinis, ped. semunc. vel ultra, tubus non coloratus, limbus et genitalia kermesini, laciniæ lineares ultra-semunc. stylo et filamentis breviores. Scape 8½ inches, slender, about 17-flowered, spathe with 4 lanceolate crimson valves, about ¼ of an inch wide, 1½ long, peduncles ½-¾ of an inch, tube green ? or pale, limb, filaments, and style crimson, segments very slender, shorter than the style which equals the longest filaments. We have no knowledge of the leaves of this remarkable Hæmanthus, which preserves the most vivid crimson colour in the dry specimen.

Hæmanthus. Roseus Link enum. 1. p. 309 is carneus. Speciosus, Colla Hort. Rip. p. 63. Hydrophilus, Thunb. Mus. Ups. Longifolius, H. Nymph. Obliquus, Don H. C. Sinuatus Thunb. Mus. Ups. are obscure and doubtful species which cannot be identified. Orbicularis is a synonym for rotundifolius.

Hermíone æquilimba.—Pl. 48. f. 1. 5. Narcissus serótinus, Rangìs Mewahhar. Zer. Fl. Melit. Bulbus 2½ unc. diam. vel minor, folia 3-4 glauca carinata ultra semunc. lata obtusa, vaginis ad basim tribus albis viridi-lineatis cylindricis ⅜ unc. diamet. scapus circ. pedalis subanceps glaucus striatus apice subtortuoso 3-7 florus, germen horizontale ¼ unc. tubus viridis ⅝, limbus stellatus subalbus laciniis ¼ unc. latis $\frac{7}{16}$ unc. longis, petalis rotundato-oblongis, sepalis acutioribus, stylus tubum paullulum exsuperans antheris sepalinis brevior, corona triloba lutea ⅛ unc. longa, ¼ lata subventricosa. After the account of Hermione elegans, *Haworth*, or Narcissus serotinus, *Desfontaines Flor. Atlant.* with a 7-flowered scape, had been sent to the press, I received bulbs of Zerapha's plant, which grows in a sequestered spot on the shore of the island of Malta, in a crumbling reddish-yellow soil, in company (as it seems) with Ornithogalum Arabicum, of which a small bulb was sent with them accidentally. They were dug up for me by the kindness of a friend late in September, and reached Spofforth the first week in November, when they were immediately potted. The largest of these wild bulbs measured 7½ inches circumference. They had evidently been in a dormant state when taken up, with the remains of the dead fibres of the last season. Zerapha has certainly made

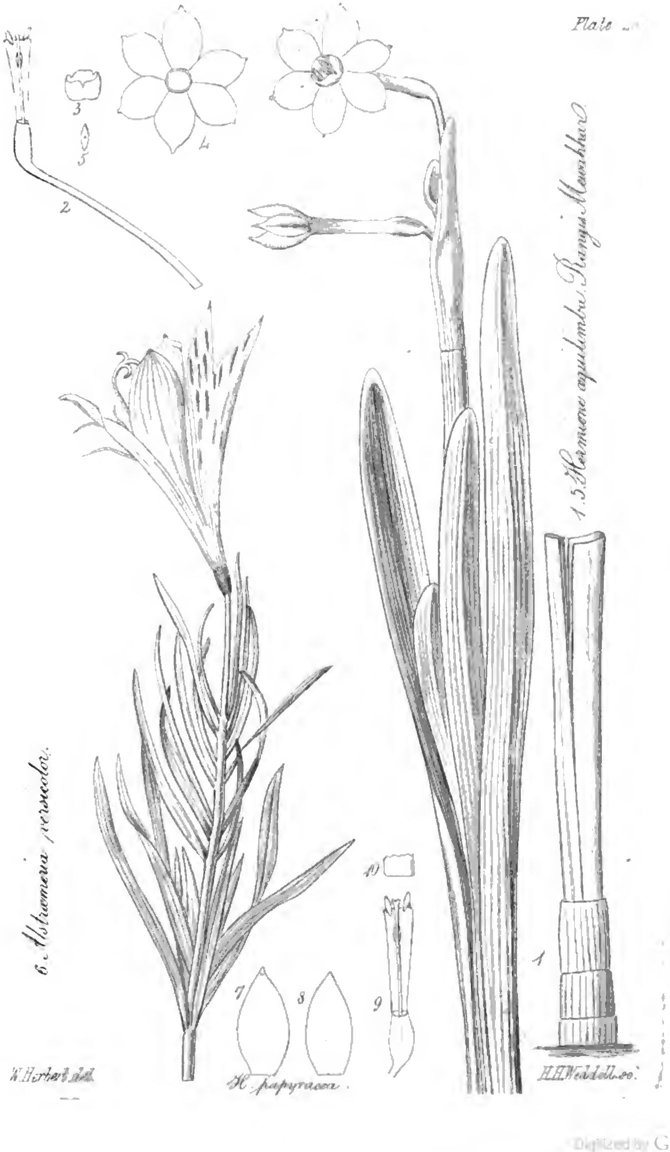


Plate
1.5. Hermione aquilimba. Rangii Mauhar
6. Alstroemeria versicolor.
H. papyracea.
1
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W. Herbert del.
H.H. Weddell sc.

an error in referring this African plant to the little 1-flowered (rarely 2-flowered) N. serotinus of Clusius, which grows in Spain, Naples, and Sardinia; and that not even as a variety, but as identical. The latter plant is very small, with slender leaves, and is said to produce its scape often before their appearance. It is generally one-flowered, though I have seen a two-flowered Sardinian specimen; but there is no record of its bearing a greater number of flowers. I have never seen a fresh specimen, but in the dry specimens the cup is not 1-16th of an inch long and about $\frac{1}{8}$th wide, and it is expressly described by Linnæus as 6-cleft, *nectario brevissimo sexpartito*. The Maltese plant has the cup full $\frac{1}{8}$ long, and $\frac{1}{4}$ wide, with only three indentures opposite the sepaline midribs; and as the length of the tube and limb is not very different in the two plants, the proportion of the cup to them is very dissimilar. I cannot ascertain the length of the style in serotina; in æquilimba it just exceeds the tube. The leaves of æquilimba rise before the flower, from 3 to 4 in number, glaucous, keeled, above $\frac{1}{2}$ an inch wide, about as tall as the scape at the time of flowering. Clusius represents the solitary flower of serotina erect, and it is nearly so in most of the specimens I have seen. Those of æquilimba are horizontal, with a stellate limb, which is remarkable from the nearly equal width of the petals and sepals. The sepals of serotina are very decidedly wider than the petals, and its leaves but the 16th of an inch wide. In all others that I have seen the sepals are widest.—Scape glaucous, lined, a little tortuous; germen horizontal; tube green, $\frac{5}{8}$ths long; horizontal; limb whitish, with a green line on the back of each segment, stellate; cup $\frac{1}{8}$th long, $\frac{1}{4}$ wide, a little ventricose, more or less three-lobed; style exceeding the tube, shorter than the sepaline filaments; expansion of the limb 1 inch and 1-16th. The leaves are enclosed at the base by three cylindrical sheaths, white, lined with green, of which the outer is about $\frac{3}{8}$ths of an inch diameter, the inner about an inch long above ground. This plant flowers in Malta at the end of October, yet is not truly an autumnal flower, but one of the earliest species in a situation and climate where there is no winter. One of the bulbs taken up in September, and placed in the stove at Spofforth the first week of November, opened its first flower on the 19th of December, the others in the same pot rather later. The strongest bulb, left in a greenhouse with a warm flue and free access of air, will not flower before January; and it is clear that, if the roots had been set in the open ground with sufficient protection from frost, they would not have flowered before March or April. H. Tazetta which does not bloom here before April or May, in its native Maltese pastures produces its flowers in January. I make no doubt that Corcyrensis planted on the hot shore of Malta, would flower in October, and I think it belongs to the autumnal section. Their autumnal flowering is not a distinct habit, as it is in some genera. Last year var. 9 of Tazetta from China, produced three flower-stems in Nov. and the same patch of bulbs produced three or four more in the spring, frost having intervened and damaged the first umbels. Till I had seen æquilimba, I concluded that it must be identical with Desfontaines's 7-flowered African N. serotinus, (Herm. elegans), but it proves to be quite different, that plant having slender leaves not $\frac{1}{8}$th of an inch wide, like serotina, and a diminutive cup. The flowers of æquilimba are sweet. This plant has been as yet discovered in no other spot; its early flowering would make it an acquisition for forcing, but perhaps it will not flower a second season freely in our cloudy climate. It might answer to the Maltese to cultivate it with manure in their sunny island for exportation. H. papyracea flowers in its native situation in Nov. and Dec. and var. 12 of Tazetta (see below) in Oct.

Hermione bifrons. Tube green, limb and cup always yellow, style just exceeding; leaves glossy green. It comes near to tazetta, but has a very different aspect. Found wild near Montpelier.

Hermione brevistyla. Tube green, limb white or yellow, cup orange or yellow however pale, style much shorter than the tube, leaves subglaucous. I find this plant in no herbarium, and its native habitation is not clearly recorded. Our gardens are filled with fine varieties of it, which are very hardy. It seems not to be a native of the neighbourhood of the western portion of the Mediterranean, from whence the collected specimens are derived, and was probably introduced into our gardens from Constantinople, which in the days of Clusius and Parkinson was in the habit of supplying us with bulbs. These short-styled plants can scarcely be supposed to have been raised by cultivation from the little H. dubia, and are evidently not garden varieties of any of the other species. Some of them were known 200 years ago, and it seems most likely that they have been derived from the northern part of the Turkish empire, beyond the walk of our collectors. Its native situation being unknown, it has consequently been overlooked by botanists, but it assuredly has a wild locality somewhere.

Hermione elegans. According to Desfontaines its style is as long as the tube. It inhabits the neighbourhood of Algiers.—See above, Hermione æquilimba.

Hermione Italica. Tube green.—v. 2. præcox. Tube $\frac{3}{4}$, limb $\frac{7}{8}$, cup about $\frac{1}{4}$, in a specimen from Pr. Tenore.

V. 4. brevis. I find a specimen from Pr. Tenore, under the name narcissus neglectus, exactly agreeing with this variety. It is, therefore, not a garden production.

V. 5. aurea. spec. Requien Herb. Hooker. N. aureus. spec. nov. Tube near $\frac{3}{4}$, cup $\frac{1}{4}$, limb $\frac{5}{8}$; style a little shorter than the cup; umbel about 10-flowered; leaves half an inch wide.

V. 6. chrysantha. N. chrysanthus, Redoutè. Spec. Herb. Hooker. Tube about $\frac{5}{8}$, limb scarcely, cup about $\frac{1}{4}$, style equalling the cup. Both golden, and closely allied.

V. 7. subalbida. N. subalbidus. Lois. Tube near $\frac{3}{4}$, limb $\frac{7}{8}$, white; cup very pale yellow, $\frac{1}{4}$; style equalling the cup. It comes near to v. 3.

The double Roman narcissi are cultivated varieties of H. Italica, with the scape very fistulous. I have two distinct.

Hermione papyracea.—Tube white, style exceeding it.

V. 1. unicolor. Tenore. 1. 26. Capri and Vesuvius. Tube exceeding $\frac{5}{8}$, cup 3-16ths, limb 11-16ths, sepals 7-16ths wide, leaves $\frac{5}{8}$ wide, style shorter than the upper anthers. Subvar. *culta*. Paper-white, germen $\frac{3}{8}$, tube exceeding $\frac{3}{4}$, limb $\frac{7}{8}$, cup 3-16ths, style shorter than the upper anthers, sepals $\frac{3}{8}$ wide, leaves glaucous, channelled, keeled, near $\frac{3}{4}$ths of an inch wide.—Pl. 48. f. 7—10. I had not had a late opportunity of examining the flower of this plant before the genus went to the press, but having forced it into flower, I find it distinguished from Tazetta by the smallness of its cup, which is not larger than that of æquilimba, viz. 3-16ths of an inch long and $\frac{1}{4}$ wide, crenulate. It is distinguishable from the rest of the genus, unless perhaps dubia, which I have not seen in a fresh state, by the tube being scarcely green. The segments of the limb are more lanceolate than usual. They are more than four times the length of the cup, and exceed the tube, which is $\frac{3}{4}$ths of an inch long. Folia semunc. glauca, canaliculata, carinata, obtusa, scapus anceps, germen $\frac{3}{8}$ unc. tubus $\frac{3}{4}$ albovirescens, limbus stellatus laciniis lanceolatis $\frac{13}{16}$ unc. sepalis $\frac{3}{8}$ unc. latis petalis $\frac{5}{16}$ albis, coronâ albâ $\frac{3}{16}$ unc. crenulatâ, $\frac{1}{4}$ unc. latâ. stylus tubum exsuperans, antheris sepalinis brevior.

Var. 2. Nivea. Loiseleur. Spec. Herb. Hooker. Tangiers. Germen 5-16ths, tube slenderer than unicolor $\frac{3}{4}$ths, cup 3-16ths, limb 13-16ths, sepals 3-16ths wide, style equalling the cup, leaves 5-16ths wide, or less, umbel 13-flowered.

The variety cultivated in Italy has the leaf and style of the native, but approaches more to the African variety in the proportions of the flower. The peduncles in all are shorter than the spathe.

Hermione Serotina.—I have ascertained by two specimens, one from stony places at the foot of the hills near Argostoli, one from the hills near Cagliari, that the posture of this flower is not really erect, as represented in all the engravings we have of it, in consequence of their having been made from specimens ill dried. The flower will become erect when the seed sets. It does not always precede the leaves; in one Neapolitan specimen I find a leaf as long as the scape, but scarcely a line wide. There is in Sir W. Hooker's herbarium a one-flowered specimen from Tangiers, marked serotinus, which is evidently the same species or variety as the two-flowered specimen represented Pl. 42. f. 6. but I cannot ascertain what its colour has been. The bulb is twice as large as those of serotina. The union of æquilimba with serotina in the Fl. Melit. is quite erroneous. I lament that I cannot ascertain the precise structure of the stamens of serotina and viridiflora, which may be found to conform with the jonquill.

Hermione Tazetta.—Tube green, limb yellow or white, cup orange or yellow, however pale; stigma between the upper anthers; leaves glaucous.

V. 12. Specimens Herb. Hooker. Lady Dalhousie, near Syrie. Oct. 10. both 4-flowered, peduncles long, tube $\frac{7}{8}$, cup $\frac{1}{4}$, limb about 11-16ths, seemingly very pale yellow.

V. 13. Spec. Herb. Hooker; in moist places. Algiers. January. Umbel 8-flowered, peduncles short, tube 9-16ths, limb 7-16ths, light yellow; cup 3-16ths, darker; leaves about $\frac{1}{4}$ wide.

V. 14. Spec. Herb. Hooker; in upland pastures near Cagliari, Sardinia. Umbel 5-flowered, ped. short, tube $\frac{5}{8}$, limb $\frac{1}{2}$ inch, seeming pale yellow (or white ?) cup $\frac{1}{4}$, leaves about $\frac{3}{8}$ths wide.

I was surprised at finding the bulbs sent to me of the native Maltese Tazetta, said to be cupularis or soleil d'or, not so wide as a common walnut, though rather longer. The succession of the species would stand more properly 3. brevistyla. 4. Italica. 5. papyracea. 6. dubia. 7. Corcyrensis. 8 Æquilimba. 9. elegans. 10. serotina. 11. obsoleta. 12. viridiflora.

I have stated the cup of H. Tazetta to be yellow or orange, meaning to include pale lemon under that definition, and to exclude white, of which I know no instance. The var. 8. is perhaps the Grand monarque. If I had certain information concerning each of the Narcissean varieties, whether it is a garden production or a wild local variety, I should give or retain a subordinate Latin name to each of the latter description, and consign those of the former to the catalogue of florist's names.

HIPPEASTRUM ACUMINATUM, γ. foliis variegatis, R. et Schultes v. 7. 2. p. 1720 is doubtless a cross-bred plant, having one quarter of the type of reticulatum by descent. I have raised similar plants, but do not believe any striped acuminatum has been found wild, or raised in cultivation without such intermixture.

HIPPEASTRUM BARBATUM.—This plant was called Amaryllis dubia by Linnæus (Amœn.), not intending dubia to be its specific name, but because he was in doubt about the plant. It is a remarkable instance of the very vague ideas then entertained of generic characteristics, that, after having referred the plant to Merian's Hippeastrum equestre, from which it is principally distinguished by its white instead of orange limb, he should at last have called it in his herbarium a Crinum, for no other reason than its agreeing with those he knew in colour. The plant has been noticed by no other writer, and has never been brought to Europe.

HIPPEASTRUM GRIFFINI. Amaryllis psittacina hybrida (Bot. Mag. 61. 3528) is the same plant.

HIPPEASTRUM MINIATUM.—Pl. 47. f. 7. Spec. herb. Hooker. Matthews, Quebrada of Panahuanca. Peru. Folia 22-unc. acuta, superne unc. lata, inferne valde attenuata, scapus biflorus 7-10 unc. spatha 1¾, ped. 1¼-1¾, per. 3¾-4 unc. cernuum, stylus limbum æquans, staminibus ⅝ longior, stigma obtusum triquetrum. I cannot doubt these Peruvian specimens of a deep red Hippeastrum being the Am. miniata of Ruiz. He says filaments, as well as style, equal to the perianth, which is very improbable. The lateral petals are about 1⅛ wide, the lowest narrow.

HYMENOCALLIS ADNATA, v. princeps.—Jacquin's plant, said (as I suspect erroneously) to have come from Tierra Bomba has the tube eight inches long, the cup eroded, one-third the length of the limb, filaments not exceeding the limb; leaves 3-4 feet long, an inch and half wide. The seedlings of this plant, which I mentioned p. 216 as thriving after they had been plunged in a cold cistern of water, in the coolest part of the stove, are still (in the month of December, 1836) thriving rapidly in that situation, where it appears that they might remain permanently, like v. acutifolia. A pot of bulbs of v. Staplesiana which had been set under water in a pond at Spofforth last summer has had the points of the leaves above water cut by the frost, but the lower part and the bulbs are uninjured. Four bulbs of v. acutifolia were turned out into a border of peaty compost at the beginning of May. They were taken up in November, without disturbing the ball, to be kept dry throughout the winter, and were found to have quadrupled their bulk, though the season was so unfavourable that the oat harvest was unfinished at the beginning of December in the neighbourhood. I am satisfied that the reason why the mule from rotata by adnata v. princeps has never yet brought to perfection its flowers, which have invariably perished in the bud, is that it requires at that period immersion in water. The mule has usually produced about six abortive buds. I shall be disappointed if I do not see its inflorescence completed next season by treating it as a swamp plant at the season of flowering. It is very probable that Hym. crassifolia may, as well as some oriental species of Crinum, require a like increase of wet to promote their blossom.

Kew Garden.—When I spoke (p. 247) of the evil consequences which flowed from the bad system pursued there, tending to loosen the ties of morality, and to create a feeling of satisfaction when it was known that cuttings had been stolen from the large plants hoarded there, by which the public were enriched without any perceivable loss to the collection, I should perhaps have stated for fear of misconstruction, that, far from justifying, I much lamented such a feeling; and I observe that I have incautiously admitted a stronger expression concerning the unpopularity of the principle on which that garden has been conducted, than I should wish to have used.

Lapiedra.—The generic name of this plant, which grows in stony situations, appears to be singularly cross-bred between the Latin and Spanish words for a stone, *lapis* and *piedra*. The name sounds well, and we must overlook its awkward parentage, but such an amalgamation should not be drawn into a precedent.

Liríope.—The name Liríope, which I gave fifteen years ago to a South American genus, appearing to have been long before applied by Loureiro to the genus Ophiopógon, I have changed it to Eliséna, an ancient name of romance: and, as the latter genus is only known to us by the description and engraving of Ruiz, the name Liriope may be abandoned without much inconvenience to the public. The rule, that the name first published shall be adopted, was made for the convenience of the public, to prevent confusion; but great inconvenience results from dragging to light names that have been unnoticed during a long course of years, and making them supersede those which have been long in vogue and recognized in systematic works. On that account I declined altering the name of Z. tubíspatha, though certainly not the original A. tubíspatha of L'Heritier. The genus Ophiopogon, well named by Mr. Ker in allusion to the Chinese appellation, has been acknowledged universally near thirty years, and I deprecate on principle the substitution at this late period of one which had been overlooked so long, as a nuisance to the public: and, unless Loureiro, whose work I have not at hand to refer to, has *defined* the genus as well as named it, and defined it by features that could have been with certainty recognized, the substitution of his old name would be irregular as well as inconvenient.

Markers.—Zinc is the only fit ingredient for labels whether to be used in the open ground or in pots. A sheet of zinc is easily cut by the gardener with strong scissors into labels of whatever size he may want. If the zinc is greasy, the labels should be steeped for a minute or two in diluted nitric acid. The following receipt for making ink for writing on the zinc was communicated to me by a gentleman who was in the habit of using it, and I have found it indelible. Take Verdigris in powder ʒi. Sal Ammoniac ditto ʒi. Lampblack ʒß. Water ʒx. Mix carefully in a mortar. Keep the ink in a bottle well corked. It must be well shaken before the pen is dipped in it.

Mule Gladioli.—It should have been mentioned, in speaking of the cross-bred Gladioli (p. 365), that I obtained two years ago several seed-pods from G. cardinalis by the pollen of various choice mules Cardinali-blandus, and Cardinali-Tristi-blandus. I had expected the seedlings, having two-thirds of the type of cardinalis, to lean towards the scarlet colour and approximate to that plant; but to my surprise the approximation (notwithstanding their greater affinity to cardinalis) was entirely to the cross-bred mule parent and not one scarlet flower appeared amongst them. It seems that to obtain the scarlet varieties, the first mule must be impregnated by a second cross with the pollen of cardinalis. The causes are perhaps two; the disposition of the perianth to follow preferably the type of the male, and of our climate to produce the less-brilliantly coloured varieties of plants which are derived from warmer latitudes.

NARCISSEÆ, p. 79. Observ. *add thereto* capsula parte superiore dehiscens; and p. 293. l. 7. *add* the upper portion of the capsule gaping.

Corbularia bulbocodium and tenuifolia are both found on the heights called Chambre d'Amour, near Bayonne. Two varieties of Ajax luteus grow on Mount Hazza, western Pyrenees.

NATURAL ORDERS.—I have perhaps not sufficiently explained, that, having taken the most decisive feature I could find to distinguish from each other the monocotyledonous orders, which I could not pretend to reform where I might think some reformation necessary, I by no means intended to assent to the importance attributed to each of those several features; for instance, I suspect that on future consideration Dr. Lindley may find it advisable to make Vanilleæ a suborder or section of Orchidaceæ, as they seem distinguished chiefly by a feature which would separate Hippeastrum and Amaryllis, placing them in distinct orders, if admitted to be of such importance. It will be understood, that by the insertion within brackets of the names of Dr. Lindley's alliances in the scheme of monocotyledonous plants (p. 45), I do not intend to make them a part of that scheme, but merely to point out where they intervene and how far they coincide, though in a different consecutive arrangement.

NERÍNE HAYLOCKI, p. 284.—Seeds by the pollen of this hybrid plant, produced upon its own scape, and on that of curvifolia, which had been deprived of its anthers, no other Nerine having been in flower at the time on the premises, have vegetated, and amongst the latter, one has produced the young leaf crimson, an appearance which I have never seen in the genus, and which will perhaps not be permanent in the adult plant; but such a remarkable seminal variation brings curvifolia in closer affinity with marginata, which is distinguished by a red margin to the leaf.

OPORANTHUS FISCHERIANUS. Pl. 47. f. 3.—Specim, Dr. Fischer. Herb. Hooker. "In collibus graminosis circa castellum Agh-oglan provinciæ Karabogh." Bulbus ovatus collo producto sexunc. semunc. lato (subterraneo?) folia subpedal. $\frac{5}{16}$ unc. lata obtusa, scapus 9-uncialis (magnâ parte subterraneus?) spatha univalvis $1\frac{1}{4}$ unc. peri. vix $1\frac{3}{8}$ (pallidè?) luteus, stylus uncialis stam. longior, stigma vix lobatum. It is immaterial whether this plant be called O. luteus Fischerianus var. or Fischerianus simply. It is very different from luteus, which has the perianth two inches long, while in this it is scarcely $1\frac{3}{8}$, and the colour is seemingly different. The scape is above nine inches, but, as the bulb has a neck six inches long and half an inch wide, probably the greater part of it was under ground.

Queltia.—§ 1. *Macrantheræ. With long anthers.* 1. Macleana. 2. montana. 3. fœtida. 4. orientalis. 5. odora. § *Bracheiantheræ. With shorter anthers.* 6. jonquilla. 7. juncifolia. 8? pusilla. 9? pumila. The anther of juncifolia agrees with that of the jonquill. I am confident that pusilla will conform with it, and I think it most probable that pumila will also. Jonquillioides and rupicola will certainly, if there be any such distinct plants. I see it suggested by a collector that Queltia aurantia, which is found wild near Montpelier, may be perhaps a mule between Narcissus poeticus and Ajax pseudo-narcissus, growing in the same pastures, and that narcissus biflorus may have originated in like manner between poeticus and Tazetta, meaning it seems the yellow bifrons, which grows in the same vicinity. I cannot admit the probability of the suggestions.

Stamen.—It is worthy of observation, that if the bud of a long-tubed flower, like Hymenocallis, be examined at an early period, while it is still enclosed in the spathe, the anther will be found to have acquired its full growth, the limb being just large enough to contain it, but the tube not developed, and its rudiments only in existence. The prolongation of the tube and peduncle, and the further growth of the limb, depending upon the nourishment afterwards afforded to the plant, must be liable to obstruction and variability. This consideration seems to uphold the view which I have taken (p. 30), that the anthers are of superior botanical importance to the perianth. The same observations tend to shew why the proportion of the limb in Narcisseæ is less important than that of the cup.

Sternebergia Colchiciflora v. Dalmatica.—Plate 47. f. 2. Specim. Dr. Fischer. Herb. Hooker. Or rather Sternebergia Dalmatica, for its aspect and proportions are very different from that of Colchiciflora, and it is very inferior in size. Bulb about $\frac{3}{8}$ths of an inch diameter, ovate, brown, tube exceeding the neck of the bulb $\frac{3}{8}$-$\frac{5}{8}$ths, limb slenderer, pale yellow, $\frac{3}{4}$-$\frac{7}{8}$ths long, style $\frac{3}{8}$-$\frac{1}{2}$ shorter than the limb, a little exceeding the longest stamens, spathe bifid, filiform.

STENOMESSON COCCINEUM.—Pl. 47. f. 4. Herb. Hooker. Matthews 786. All doubts about this plant are set at rest by fresh specimens received by Sir W. Hooker from Chacopoyas in Peru. Scapes 4-flowered, perianth scarlet, $1\frac{1}{4}$ inch or a little more, style $\frac{1}{4}$ of an inch longer, capsule formed like that of St. flavum. They agree with Ruiz's specimen, but not with the figure in Flor. Peruv. which is incorrect.

TAPEINANTHUS HUMILIS.—Cav. ic. 129. t. 207. f. 2. This plant flowers in October. Scape filiform, 3 inches; cup small, dentate, or 12-cleft, filaments equal, nearly as long as the limb; direction of the tube continuous from the germen and peduncles; peduncles unequal; leaves slender, awl-shaped.

VALLOTA PURPUREA.—I have lately had an opportunity of examining many ripe specimens of the fruit of this plant. The capsules, which are oblong-oval, begin to gape near the base, where the valves are attenuated. The seeds, which are 7-16ths of an inch long, have the lower 5-16ths absolutely empty, being merely a foliaceous wing attached at the base, where it is narrow, by a very slender umbilical chord. The chalaza points obliquely to one side, the other side of the seed having a curved back. The albumen or kernel lies in the upper 2-16ths transversely, the embryo pointing from the chalaza to the opposite side of the seed. The seeds which are in the lower part of the capsule, where it is narrow, cannot develope themselves into this form, and are narrow and straighter, the chalaza more vertical, and the kernel and embryo not transverse, but pointing towards the foramen at the base. This is important to shew how insignificant is the position of the embryo with relation to the hilum in some cases.

VELLOSIA ABIÉTINA.—Martius. fine blue. Omitted by accident in p. 81.

POSTSCRIPT.

Bomarea salsilla.—I mentioned (p. 110) that this plant differed from the other Bomareas I had seen, in a very decided flexion of the filaments, but that its half-ripe capsule seemed conformable with theirs. I have now its ripe seeds before me, and they differ materially from those of hirtella and acutifolia. They have no soft pulp, but a tight coat, not easily separable, but minutely wrinkled, with a very prominent loose wrinkled raphe and chalaza. We do not possess a sufficient number of Bomareas to be able to trace out these diversities.

Hymenocallis expansa: var. stricta. Foliis erectioribus superne latioribus, floribus erectioribus laciniis angustis. Leaves above the middle 2$\frac{3}{8}$ths of an inch wide, more erect, but equally acute; flowers 11, more upright; tube 4 inches, limb $\frac{1}{4}$ of an inch shorter, just exceeding the style, 1$\frac{1}{4}$ longer than the filaments, segments only $\frac{3}{16}$ths wide, cup $\frac{3}{8}$ths long, constricted at the base, margin denticulate.

Hymenocallis Caribea, v. princeps, has the anthers deeper coloured than v. cinerascens.

The delay which has taken place in the publication of this volume, the plates not having been ready, has enabled me to clear up some obscure points concerning the Narcisseæ. The stature of A. nanus, *Haw.* is more erect than that of minor, but it has, like v. princeps and humilior, the tube $\frac{1}{2}$ inch long, the cup $\frac{11}{16}$ths, and the limb shorter than the cup, the style half an inch shorter. It may be called v. altior; nanus will not do. Festalis, *Salisb.* pl. 43. f. 3. differs only in having a narrower leaf. I have never had pumilus and cuneifolius; they may perhaps form a separate diminutive species. I find unrecorded differences which I had not anticipated in the sulphurescent species, and, with me, the tube of tortuosus, unless there be two varieties of it, scarcely loses the yellow from the end of the cup. The superior breadth of the leaf of Sabinianus is an additional proof that it is a genuine species. I arrange the genus thus: 1. Pseudonarcissus. Closely allied to minor. *Corona lutea limbum pallidiorem æquans, stylo semunciam longior; filamenta* (*uti in* 2 *et* 3) *prope basin inæqualiter adnata.* Cup yellow, equal to the paler limb, $\frac{1}{2}$ inch longer than the style; filaments (as also in 2 and 3) adnate unequally near the base. 1. Ryticarpus; 2. nobilis; 3. Telamonius. Festalis, pl. 43. f. 3. belongs to minor, on account of the excess of the cup. The other varieties I have not examined.—2. Minor. *Corona lutea limbum pallidiorem superans, stylo semunc. longior.* Cup yellow, exceeding the paler limb, $\frac{1}{2}$ inch longer than the style. 1. princeps; 2. humilior; *minimus, Haw.* Leaves a little shorter, cup deeper, and limb shorter, but the difference scarcely worth remarking. 3. altior; *nanus, Haw.* scape 8 inches; leaves less tortuous, $\frac{3}{8}$ths wide; 4. ? cuneifolius; 5. ? pumilus.—3. Luteus. *Corona lutea limbum concolorem ferè parum superans, stylo $\frac{3}{4}$ unc. vel ultra longior.* Cup yellow, a little exceeding the limb, yellow also, $\frac{3}{4}$ths of an inch or more longer than the style. 1. maximus; 2. major; 3. propinquus; 4. obvallaris. I have not examined the last.—3. Tubæflorus. *Corona lutea limb. pallidiss. æquans, stylo $\frac{1}{8}$ unc. longior; fil. basi ipsi adnata.* Cup yellow, equal to the very pale limb, $\frac{1}{8}$th of an inch longer than the style. 1. princeps; 2. crenulatus.—5. Bicolor. *Cor. lutea limbum pallidiss. æquans, stylo $\frac{1}{4}$ unc. longior; fil. prope basin æqualiter fere adnata.* Cup yellow, equal to the very pale limb, $\frac{1}{4}$ longer than the style; filaments adnate near the base almost equally. 1. lorifolius; 2. breviflos; 3. anceps.—6. Tortuosus. *Cor. citrina colore seriùs obsolescente limbum subalbescentem superans, antheris $\frac{7}{8}$, stylo $\frac{5}{8}$ longior; fil. $\frac{1}{4}$-$\frac{3}{16}$ a basi adnata.* Cup lemon, fading late and imperfectly to sulphureous white, longer than the limb, $\frac{5}{8}$ths longer than the style, $\frac{7}{8}$ths than the anthers; filaments adnate, from $\frac{1}{4}$ to $\frac{3}{16}$ths of an inch from the base, sepals $\frac{3}{4}$ths, petals $\frac{5}{8}$ths wide, tortuous. N. moschatus α Bot. Mag.—7. Albicans. *Cor. citrina mox subalbescens limbum subalbescentem superans, stylo unc. antheris* $1\frac{1}{4}$, *longior; filam.* $\frac{1}{4}$-$\frac{3}{16}$ *basi adnata.* Cup lemon, turning whitish soon, longer than the limb, exceeding the style an inch, the anthers $1\frac{1}{4}$; filaments adnate as in Tortuosus; sepals $\frac{13}{16}$ths, petals 11 wide, tortuous.—8. Cernuus. *Corona cernua citrina mox subalbescens limbum subalbescentem superans stylo unciam fere longior; fil. circ.* $\frac{1}{8}$ *unc. a basi adnata.* Cup hanging down, lemon, turning soon to whitish, exceeding the style near an inch, the anthers near $1\frac{1}{8}$; filaments adnate at about $\frac{1}{8}$th from the base, sepals $\frac{11}{16}$ths, petals 9 wide, tortuous. The filaments of tortuosus are slenderer, of cernuus thicker, though shorter, than those of albicans; the anthers of cernuus a little longer and yellower. I suspect tortuosus of being a garden cross between albicans and bicolor.—9. Moschatus. *Cor. sulphurea mox albescens limbum album æquans, stylo* $\frac{1}{4}$ *longior.* Cup sulphur, turning to white, longer than the white limb, exceeding the style $\frac{1}{4}$ of an inch. N. Moschatus δ. Bot. Mag. 32. 1300.—10. Sabinianus. *Cor. lutea limbum album superans, stylum æquans; fil.* $\frac{1}{4}$-$\frac{3}{8}$ *a basi inæq. adnata.* Cup yellow, longer than the white limb, equalling the style; filaments adnate unequally $\frac{1}{4}$ and $\frac{3}{8}$ths of an inch from the base.—Ganymedes. Its anthers are attached nearer the middle than those of Queltia, and their margins do not come in contact behind. Striatulus is shorter, stouter, with larger cup and limb than pulchellus, and its petaline stamens more prolonged; style long and salient.—Hermione. A specimen of wild Hermione, just received from the Hon. Wm. Fox Strangways, very common near Genoa, exhibits the natural form of H. brevistyla, which I had found in no herbarium. Flowers 3-4, fragrant; tube a little exceeding half an inch, green; limb 3-8ths, white; sepals much wider than petals, cup deep orange, not 3-16ths long; style 3-16ths shorter than the tube; leaves narrow. Bifrons is the only Hermione with leaves not tending to glaucous; no Ajax has green, no Corbularia glaucous, leaves.—H. Dubia, incorrectly represented in Redouté, has the style as long as papyracea, of which it is clearly a variety, with shorter and blunter segments. By a recent examination of a live specimen, I am satisfied that N. pumilus of Redouté is a weak one-flowered specimen of H. dubia, var. 1. The flower tallies exactly, and the wild specimens are often 2-flowered. In cultivation the flowers become more numerous, and the leaves broader, than in any of the three wild varieties. Herm. dubia must therefore be transferred to papyracea, as v. 3. dubia, or more properly Gallica, and its wild variations marked subvar. My opinion of N. pumilus of Redouté is confirmed by information since received from Paris, that no trace of it exists there.—One var. of double Hermione is brevistyla.——Queltia pumila must be expunged as a nonentity.—A fine 2-flowered variety of Queltia odora grows amongst the chesnut trees near the church of N. Senhora del Monte in Madeira. Var. 8. Isometra; germine, tubo, et coronâ isometris, fere semuncialibus, limbo $\frac{3}{4}$ unc. coronâ stylum $\frac{1}{16}$ superante leviter sexlobâ. Germen, tube, and cup equal, each near $\frac{1}{2}$ inch, limb $\frac{3}{4}$, long; cup exceeding the style 1-16th, slightly six-lobed. The fetid Queltia cannot be, as some have suggested, a cross between plants of agreeable scent.

The curious mule Rhododendron (see p. 359) from the plant called Rhodora Canadensis by Az. Pontica is now in flower. The flowers are of a very pale yellow, with from seven to nine stamens. It will be figured in the Bot. Reg.

March 25, 1837.

I have to-day received a plant of Pancratium parviflorum of Redouté, with which I am favoured from the Jardin des Plantes at Paris. The instant I saw its leaves, I was convinced of its being Lapiedra Placiana. The leaf exactly agrees with the figure of Barrelius and the description of Clusius that it resembles that of Oporanthus luteus, with the difference of having a longitudinal whitish stripe. It is strange that Barrelius and Lagasca should have entirely overlooked the tendency to a Pancratiform structure in the stamens, and Redouté have represented the leaf so imperfectly, that no person had, or could have, suspected the identity of the plants. I am confident that the bulb sent to me from Paris must be Lapiedra. The name Lapiedra Placiana must therefore be removed from the Oporanthiform section, and substituted for Vagaria parviflora, which must be expunged. The account of the leaf, seed, and habitation, under the head Lapiedra, will be correct; but that of the flower must be taken from the article Vagaria and the figure of Redouté.

April 2, 1837.

GLOSSARY.

Acuminate.	Having a prolonged point, gradually attenuated.
Adnate.	Adhering to laterally.
Albumen.	A substance which in its perfect and solid state is ground into flour.
Anthers.	The portion of the male part of a flower which contains the pollen or particles of dust that, by contact with the stigma, fertilize the ovary.
Antitropous.	A seed is so called when the embryo in it is inverted.
Apetaloid.	Having no appearance of petals.
Apiculate.	Having a prolonged slender point.
Assurgent.	Having the ends rising upwards from a horizontal posture.
Auriculate.	Having projections like ears.
Articulate.	Jointed.
Axillary.	Growing out of the axil or angle between the base of a leaf, or its petiole, and the stalk or branch on which it grows.
Axis.	The central column in a fruit which supports the style, and connects it with the footstalk.
Bilabiate.	Having the form of two distinct lips, the base of the segments being united in two separate parcels.
Bracteate.	Furnished with bractes.
Bracte.	An appendage to the inflorescence, sometimes leaf-like, sometimes filiform, from the axil of which a flower-bud usually proceeds. There is no perfect distinction between bractes and the valves of an involucre or spathe. A bracte is properly with respect to a flower, that which a stipule is with respect to a leaf.
Calycine.	Belonging to, or having the office or semblance of, a calyx.
Calyx.	The outer leaf-like envelope of a flower.
Campanulute.	Bell-shaped.
Capitulate.	Having the flowers in a crowded head.
Caulescent.	Having a leaf-bearing or articulate stalk.
Centrifugal inflorescence.	Beginning to flower in the centre of the umbel.
Centripetal inflorescence.	Beginning to flower at the outside of the umbel.
Chalaza.	A marked point in a seed, indicating the position of the cotyledon or cotyledons, remote from the foramen through which the radicle usually issues.
Ciliated.	Edged with hairs like the eyelids.
Clavate.	Club-shaped.
Conniving.	Closing inwards.
Coroll.	The inner envelope of a flower, usually more ornamental than the calyx.
Crenate.	Notched.
Crenulate.	Slightly notched.
Cumulate.	Heaped one on the other.
Cuneate.	Wedge-shaped.

Decurrent. Applied to the filaments, when their course down the tube is visible below the point of their insertion.

Dehiscent. Gaping.

Dentate. Having prominences like teeth.

Denticulate. Having prominences like small teeth.

Depauperated. Having some material part wanting, or defective.

Disk. The superior surface of the germen round the base of the style. The word has elsewhere had a more extensive and vague application, including the cup or nectary.

Dissepiments. The lateral partitions of the cells of the germen and fruit.

Emarginate. Having the margin uneven, like the edge of a wound just cleansed out or dressed ; an expression taken from surgery.

Embryo. The organized body within the seed, consisting of the cotyledons or undeveloped leaves, the ascending plumule, the descending radicle, and the neck which connects the cotyledon or cotyledons with the radicle.

Ensiform. Sword-shaped.

Epigynous. Having the position of the stamens above the future seed-vessels, and consequently thegermen below the perianth.

Epiphytes. Plants that grow upon other plants.

Falcate. Sickle-shaped.

Filaments. That part of the stamen which supports the anther, so called because its form is most frequently thread-like.

Filiform. Having the form of a thread.

Fimbriated. Terminating in fringe-like processes.

Foramen. A minute aperture in the seed, through which the embryo is fertilized and the radicle usually issues.

Faucial. Situated on the throat or mouth of the tube of the perianth.

Germen. The future fruit before the decay of the perianth.

Glabrous. Perfectly smooth.

Glumaceous. Having scales instead of calyx or corolla.

Gynandrous. Having the style consolidated with the stamens.

Heterotropous. Having the position of the embryo in the seed oblique.

Hexandrous. Having six stamens.

Hexapetaloid. Having the semblance of six petals.

Hilum. The scar on a seed where it had been attached to the umbilical chord, including the umbilicus and the space between it and the foramen, if not the foramen itself.

Hypogynous. Having the position of the stamens below the ovary, consequently the germen within the perianth.

Imbricating. Overlapping like tiles on a roof.

Inarticulate. Not jointed.

Incurved. Bent forwards, or down.

Involucre. An envelope to an inflorescence, not on the summit of an umbellate inarticulate scape.

Involucrate. Having an involucre.

Lanceolate. Shaped like a lance-head, that is, slenderer than ovate.

Limb. The part of a perianth, or coroll, which is not tubular.

Linear. Having the margins parallel and not distant.

Lorate. Shaped like a thong, that is prolonged with parallel margins.

Monadelphous. Having the base of the stamens united.

Obovate. Egg-shaped reversed, the base narrowest.

Opercle. The persistent base of a style, forming a prominent point to an ovary in an epigynous flower.

Operculate. Having such a prominent point to the ovary.

Oval. Egg-shaped, attenuated equally at both ends.

Ovate. Egg-shaped, the base broadest.

Ovule. The future seed before it is fertilized, and in an early state of immaturity.

Parietal. Forming a wall or side; or belonging or adhering to a wall or side.

Patent. Expanded wide.

Peduncle. The foot-stalk which connects a flower with the scape, stalk, or branch; simple, when it connects one; compound, when it is branched, and each branch thereof connects one.

Pentandrous. Having five stamens.

Perianth. The foliaceous part of a flower which has no calyx, consisting of outer and inner segments, called sepals and petals, with or without a tube.

Pericarp. That which contains the seed, and which was the germen or ovary before the decay of the perianth.

Persistent. Continuing after the usual period of decay.

Petaline. That which has relation to a petal; petaline filament, that which is inserted in or below a petal.

Petaloid. Having the appearance of petals.

Petals. The segments of a coroll; the inner segments of a perianth.

Petiole. The footstalk which connects a leaf with a stalk, branch, or root.

Plicate. Plaited, having folds.

Pollen. The small dust-like particles, which issue from the anther, and by contact with the stigma effect the fertilization of the ovules.

Porandrous. Discharging the pollen through a pore or partial aperture in the anther.

Recurved. Bent back, or upwards.

Repand. Having the margin bent down backwards.

Resupinate. Properly lying on its back, or thrown back: but used by botanists in a contrary sense to signify reversed, when, by the twisting of the footstalk, the back of a leaf is turned upwards, or the lowest part of a flower is uppermost.

Rosulaceous. Having the leaves crowded round the head of a stalk, in the likeness of a rose, diminishing in length towards the centre.

Rosule. A rosulaceous or rose-like head of leaves, having the form of an umbel.

Sagittate. Having the form of an arrow-head.

Scape. A succulent inarticulate flower-stem.

Scapaceous. Having a scape.

Secundifolius. Secundus (second) is used by botanists to express the bending of all the leaves on a stalk one way. That, which is second, follows; and I suppose the leaves are considered by their similar inclination to follow or second each other.

Segment. One of the divisions into which the limb of a flower is cleft.

Sepals. The segments of a calyx; the outer segments of the limb of a perianth standing in lieu of a calyx.

Sepaline. That which has relation to a sepal. Sepaline filament, that which is inserted in or below a sepal.

Serrate. Edged like a saw.

Sessile. Seated on the scape, stalk, or branch, without the support of a footstalk.

Siliqua. A long capsule with two valves, and two parietal placentæ, to which the ovules are attached. Silicula is precisely the same thing shorter and broader.

Spadiceous. Having a spadix.

Spadix. Originally the inflorescence of a palm, which has apetaloid flowers close set round a stalk, with an involucre below: applied to any like form of inflorescence, even when the involucre is wanting.

Spathe. An envelope consisting of one or more leaves, usually called valves, enclosing the buds of a scapaceous umbel before they break through.

Spatulate. Shaped like a spatula or spoon, wider near the end and attenuated below.

Stamen. The filament and anther.

Stigma. The summit of the style, often fringed, through which the influence of the pollen is received and conveyed to the ovary.

Strophiolated. Having strophioles.

Strophioles. A girdle of wrinkles or tubercles around the hilum or chalaza of a seed. The umbilical chord has sometimes been called a strophiole, but this creates confusion.

Strumous. Preposterously enlarged in part; strictly having a wen.

Style. The column proceeding from the summit of the ovary which supports the stigma.

Sub. In compound prefixed to an adjective signifies a tendency to the quality it represents, as subglaucous, of a colour tending to glaucous; subacute, not acute, but nearly so.

Subulate. Awl-shaped.

Suffruticose. Having a tendency to the form of a shrub.

Triandrous. Having three stamens.

Tripartible. Separable into three.

Tripetaloid. Having the appearance of three petals. *All adjectives formed from a substantive, with the addition of* oid, *signify having the appearance thereof.*

Tubed. Having a tube.

Tube-shaped. Having the appearance of a tube, though cleft.

Tubular. Consisting of a tube.

Turbinate. In the form of a top, greatly attenuated at the base.

Valves. The portions into which a dehiscent pericarp or a spathe splits.

Ventricose. Bellying out, enlarged towards the middle.

Versatile. Easily moveable on the point of its attachment.

Villous. Fleecy, woolly.

Umbel. A head of flowers of which the footstalks properly diverge from nearly the same plane, but in crowded umbels the centre is often much protruded.

Umbilicus. The point in a seed of attachment to the chord by which it is connected with the ovary, and through which it is nourished.

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